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# Epidemics, pandemics, and social conflict: Lessons from the past and possible scenarios for COVID-19

Remi Jedwab\*, Amjad M. Khan, Jason Russ, Esha D. Zaveri

George Washington University, Elliott School of International Affairs, 603 North Henry St, Alexandria, VA 22314, USA



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## ABSTRACT

Since COVID-19 broke out, there has been renewed interest in understanding the economic and social dynamics of historical and more recent epidemics and pandemics, from the plagues of Antiquity to modern-day outbreaks like Ebola. These events can have significant impacts on the interplay between poverty and social cohesion, i.e. how different groups in society interact and cooperate to survive and prosper. To that effect, this paper provides a theory-driven overview of how social responses to past epidemics and pandemics were determined by the epidemiological and non-epidemiological characteristics of these outbreaks, with a particular focus on the conditions giving rise to scapegoating and persecution of minority groups, including migrants. We discuss existing theories as well as historical and quantitative studies, and highlight the cases where epidemics and pandemics may lead to milder or more severe forms of scapegoating. Finally, we conclude with a summary of priorities for future research on epidemics, pandemics and social conflict and discuss the possible effects and policy implications of COVID-19.

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## 1. Introduction

*Epidemics* – disease outbreaks that infect a large share of individuals in a community – and *pandemics* – epidemics that are spread over a wide geographic area – have drastic impacts on economic and social setups. Social cohesion and its interplay with poverty and inequality during such crises is determined by how different groups in society coordinate and interact with each other to ensure collective survival and prosperity during and after these disaster events.

Widespread reports in media sources over the first thirteen months of the COVID-19 crisis show spikes in divisions, with some minority groups scapegoated for the spread of the disease and its pursuant health and economic impacts.

Since COVID-19 broke out, there has been renewed interest in understanding the social effects of historical and more recent epidemics and pandemics. While the literature has described how some of these events have given rise to social conflict, most studies do not provide a systematic overview of the scapegoating-epidemic relationship.

In particular, why did some epidemics lead to scapegoating while others did not? Why did scapegoating take a “milder” form in some cases (e.g., medicalized prejudice) or a more “severe” form in other cases (e.g., mass murders)? Did the probability of scapegoating, and its severity, depend on the characteristics of the

disease itself – how mysterious and deadly it was, who died more (e.g., children or adults?), etc. – and/or the economic, social, and political context in which it took place? And how did the flow of information (and misinformation) during these crises impact social conflict? Lastly, what was the role of policies in place before and after these events? Answers to these questions are critical for forming policies to prevent social conflict in the face of COVID-19 and future epidemics. However, to our knowledge, there are no existing short inter-disciplinary surveys of the topic.

To fill this gap, this paper surveys existing theories as well as historical and quantitative studies. The evidence suggests that epidemics are more likely to lead to social conflict: (i) when they are not so lethal; (ii) when they have distressing symptoms; (iii) when mortality rates are disproportionately higher for young children than for adults; (iv) for “intermediary” levels of scientific knowledge of the mechanisms by which the disease transmits, i.e. when the disease is neither attributed to supernatural causes nor yet fully understood by the medical community, authorities, and populations; (v) when intergroup tensions are already rife; and (vi) when authorities encourage, or allow, scapegoating or implement heavy-handed policies that lead to distrust within the population.<sup>1</sup>

<sup>1</sup> The economies of Antiquity or the Medieval economies that this review focuses on had similar income levels as countries classified as “low-income” by the World Bank today (Bolt & van Zanden, 2014). In addition, the income level of Western countries in the 19th century when cholera, smallpox, and yellow fever outbreaks were frequent, and the world's average income level when the 1918 Influenza broke out, were similar to the most developed low-income countries today.

\* Corresponding author.

E-mail address: [jedwab@gwu.edu](mailto:jedwab@gwu.edu) (R. Jedwab).

The rest of the paper is organized as follows. The next section describes broad theoretical insights on social conflict and how these may apply in the context of epidemics. Section 3 provides a historical survey describing various epidemics dating back to antiquity and how societies responded to them. Section 4 merges the theoretical insights on social conflict with the historical evidence to identify possible channels that determine the epidemic-scapegoating relationship. Section 5 concludes with a description of some cases of scapegoating in modern societies during COVID-19.

## 2. Theoretical literature

### 2.1. Theories of social conflict

When multiple groups defined on the basis of identity exist in a society, they compete and coordinate to determine the allocation of resources between their members. The political power of groups in influencing the collective bargaining process is determined by their population sizes and the distribution of economic resources between and within them. Shocks modify this “social equilibrium”, possibly even leading to longer-run changes in the rules of the “game”, and may affect the likelihood of social conflict.

The literature has shown how inter-group conflict can be driven by “grievances” – when people engage in conflict over issues of identity – or “greed” – when engaging in conflict is motivated by a desire to improve one’s economic situation (Collier & Hoeffler, 2004). Grievances can be exploited to obtain gains by violent means (Ray & Esteban, 2017). Inequality also leads to conflict if it causes grievances or incentivizes a relatively poor group to engage in conflict (Blattman & Miguel, 2010).

Negative shocks raise the likelihood of conflict, because poverty reduces the opportunity cost of engaging in conflict, making it easier for groups prone to engaging in conflict to recruit members, and weakens the capacity of the state to counter conflict (Miguel & Sergenti, 2004; Bazzi & Blattman, 2014). At the same time, negative shocks reduce the size of the cake to fight over (Dal Bo and Dal Bo, 2011; Ray and Esteban, 2017). Inequality then fuels or decreases grievances depending upon the power balance between groups (Ray and Esteban, 2017).

While the literature has focused on civil war, there is a broader literature on social conflict, which Ray and Esteban (2017) define as “within-country unrest, ranging from peaceful demonstrations, processions, and strikes to violent riots and civil war”. Within this literature, the focus has been on the respective roles of ethno-linguistic fractionalization (Collier & Hoeffler, 2004) and polarization (Esteban Joan and Debraj Ray, 1994; Esteban & Ray, 2011b; Esteban, Mayoral, & Ray, 2012).

Conflict is more likely to take place along ethnic lines than along class lines, because: (i) Ethnicity is not easily disguisable; (ii) Conflict requires both economic resources and conflict labor (i.e. individuals who accept to be paid little to fight), which can both be found within the same ethnic group but not within the same class (Esteban & Ray, 2008); (iii) Ethnicity proxies for income if ethnic groups are professionally specialized (Esteban & Ray, 2011b); and (iv) Ethnicity is “a strategic basis for coalitions that seek a larger share of economic or political power” (Ray & Esteban, 2017). Strategic ethnic conflict allows “winners” to share the spoils of conflict among fewer individuals. In contrast, revolutions imply that the spoils are shared among a broader set of individuals.

### 2.2. The scapegoat theory of intergroup conflict

In the wake of the Holocaust, a literature arose in political science, psychology, and sociology investigating the importance

of scapegoating as a cause of violence (Doob et al., 1939; Hovland & Sears, 1940; Girard, 1978; Allport, 1979; Staub, 1992; Poppe, 2001; Glick, 2002; Glick, 2005; Glick, 2009). According to this literature, members of a majority experiencing prolonged negative experiences can settle on a specific target to blame for their grievances. By faulting a minority group, members of a majority group experience emotional relief. In addition, some members of the majority group may have strong pre-existing biases before the negative experience. A crisis then provides the cover and a rationale for furthering these agendas. A collective negative experience can thus serve as a coordination mechanism for majority members with strong anti-minority views and as a persuasion mechanism for majority members who do not have such views.

### 2.3. Attitudes toward immigrants

Providing a survey of the literature on the effects of immigration on public attitudes, Hainmueller and Daniel (2014) explain that migrants could be blamed because of the competition over economic resources between migrants and natives or because they are seen as a threat to their safety (for example, because of crime) and national identity (for example, their culture is viewed as too “different”).<sup>2</sup> The targeting of certain groups arises as a coping strategy, giving rise to minorities being blamed for the negative experiences of the majority group.

### 2.4. Epidemics and scapegoating

Epidemics create emotional distress as people experience death and illness among their community members. Incomes are also lost as production initially collapses (Barro et al., 2020). In the short-run, these negative effects on life satisfaction raise the probability of scapegoating. The literature shows how some epidemics have resulted in the scapegoating of minorities (Nelkin & Sander, 1988; Eamon, 1998; Craddock, 2004; Lin, Hall, Khoe, Bodomo, & Rothstein, 2015).

In the longer run, effects are more ambiguous. First, survivors obtain the property of the deceased. Second, if population decreases and the stock of housing and infrastructure is “durable” (Glaeser & Gyourko, 2005), housing prices and congestion decrease (Jedwab & Vollrath, 2019). Third, the epidemic may cause a labor scarcity effect leading to wage increases (Young, 2005). In addition, inequality could be reduced if the price of labor (wages) increases relative to the value of capital and land (The, 2018; Alfani, 2020). These effects depend on how many people die, and who dies, in particular working-age adults or dependents (Bloom & Canning, 2006; Weil, 2010). At the same time, during the epidemic, investments in physical and human capital contract in reaction to the large uncertainty that accompanies such events (Baker, Bloom, Davis, & Terry, 2020). Finally, an epidemic could affect fertility (Boucekkine, Desbordes, & Latzer, 2009), and thus future population and economic growth (Galor, 2011), as well as institutions (Evans, 1988).<sup>3</sup>

<sup>2</sup> Other studies include Mayda (2006), Facchini and Mayda (2009), Card, Dustmann, and Preston (2012), Dustmann, Vasiljeva and Piil Damm (2019), and Tabellini (2019).

<sup>3</sup> The epidemic could produce growth-enhancing institutional change, for example by fostering nation-building if the epidemic reinforces national identities over ethnic or religious identities –, state-building – if the epidemic leads to reforms that improve state capacity –, and pro-poor policy agendas – if containing, and mitigating the economic impact of, the epidemic cannot be done without policies targeting the poorest segments of society. On the negative side, nationalistic, authoritarian and rent-seeking governments could use the epidemic to adopt more protectionist policies and further their control of society and the economy.

## 2.5. Epidemics and cohesive forces

The scapegoating effect could be offset, or even dominated, by three effects.

First, there could be a “come together” effect if the stress of disaster brings people together. Stress leads to a sense of vulnerability, leading to greater empathy (Taylor et al., 2000; Converse, Risen, & Travis, 2012). The majority group could see that the minority is also affected and cannot be blamed for the epidemic. In addition, as the psychological literature explains, acute stress (e.g., coming from “one-time” life-threatening shocks) leads to more demand for social bonding, because humans feel vulnerable (von Dawans et al., 2012; Sapolsky, 2017; Sapolsky, 2018).

Chronic stress (e.g., coming from repeated exposure to stress over a long period of time, for example due to chronic poverty), on the other hand, could lead to lower demand for social bonding (Sapolsky, 2017; Sapolsky, 2018) and lower empathy (Martin et al., 2015; Starcke et al., 2011; Youssef et al., 2012). Chronic stress also “provokes [displacement] aggression for the simple reason that aggression reduces stress” (Sapolsky, 2018). Since stress limits a human’s ability to restrain impulses (Hackman, Farah, & Meaney, 2010; Sheridan, Sarsour, Jutte, D’Esposito, & Boyce, 2012), it can result in acts of aggression (Sapolsky, 2018).

Second, if a large number of individuals die during an epidemic, survivors may experience a sustained improvement in their standards of living, which could limit occurrences of scapegoating.

Third, there could be an economic complementarity effect if minority groups provide skills that help an economy become more resilient during an epidemic, or recover more rapidly after it.

## 2.6. Epidemics and social capital

Social capital “refers to the norms and networks that enable people to act collectively” and trust and reciprocity are some of its important features (Woolcock & Narayan, 2000). While social capital promotes economic development (Algan & Cahuc, 2014), the role of social capital can also be destructive (Woolcock & Narayan, 2000; Mansuri & Rao, 2004). Members of a close-knit community may isolate themselves from economic opportunities outside the community and strong intracommunity ties may come at the expense of intercommunity networks. The literature thus distinguishes “bonding” and “bridging” social capital.

During an epidemic, bonding social capital could help individuals cope with negative life satisfaction effects. At the same time, if bridging social capital is weak, i.e. if there is mistrust between communities, bonding social capital might contribute to reinforcing intergroup conflict. If governments fail in their policy response to the epidemic, this may negatively impact trust and communities may turn inward.

## 3. Past and more recent epidemics and scapegoating

### 3.1. Epidemic characteristics

The mortality rate of a disease depends on its contagiousness – measured by the *basic reproduction number* ( $R_0$ ) – and deadliness – measured by the *infection fatality rate* (IFR), or *case fatality rate* (CFR) if only diagnosed cases are considered. Contagiousness is reduced as previously infected individuals acquire immunity and policies are implemented and changes in behavior are induced. The reproduction number after accounting for these factors is referred to as the *effective reproduction number*. Likewise, deadliness decreases as medical technology and health infrastructure adapt. Mortality can then vary by age or gender or preexisting conditions. Since epidemics can emerge from water- or insect-borne

infectious diseases and can spread through respiratory droplets, sex, or body fluids, mortality could be higher in more developed and connected areas, or in overcrowded poor areas.

Non-epidemiological characteristics that may matter are: (i) How economically impactful the disease is. For example, are incomes collapsing because of the epidemic?; (ii) The economic context in which the epidemic takes place. For example: is the economy thriving or declining? Do most people live close to the subsistence level? (iii) The socio-cultural context in which the epidemic takes place. For example, are there already some tensions along racial, religious, gender, class, or origin lines?; and (iv) The political context in which the epidemic takes place. For example, is the state democratic, benevolent and inclusive, or autocratic, extractive and exclusive, whether the state accentuates social, ethnic or religious differences for political gain and the level of trust in government, etc.

The following section discusses the scapegoating effects of selected epidemics. Note that the characteristics of each epidemic are reported in Table 1.

### 3.2. The plagues of Antiquity

Ancient Greece and Ancient Rome were often afflicted by epidemics, including the Plague of Athens (430–427 BCE), the Antonine Plague (165–180 CE), the Plague of Cyprian (249–262 CE), and the Justinian Plague (541–542 CE). The consensus is that the Antonine Plague was smallpox, the Plague of Cyprian was smallpox or Ebola, and the Justinian Plague was the bubonic plague (Littman, 2009).

During the Plague of Athens, 25 percent of the population of Athens died. The plague was attributed to a very wet winter and overcrowding (Cohn, 2018). Cohn (2018) describes how no minority group was blamed, and this despite the fact that migrants had higher mortality rates than natives. Samuel Cohn cites the first century BC historian Diodorus Siculus who explained that mortality was high in Athens because many migrants had moved to its “cramped quarters” where they were breathing “polluted air”. As such, migrants were the victims of the “polluted air” that caused epidemics, not the instigators.

The Antonine Plague killed as much as 25 percent of the Roman Empire’s population (Duncan-Jones, 1996). The contemporary chronicler Galen documents how skin eruption was a particular symptom of the plague, which explains why it was most likely smallpox, whose CFR is about 30 percent in its major form (WHO, 2020a). The fatality rate for infants was high (Barquet & Domingo, 1997). Smallpox was transmitted by breathing the droplets of an infected person coughing, sneezing, or talking, through contact with infected body fluids or contaminated objects. Despite the fact that the disease was particularly lethal and visually distressing (infected individuals had pustules all over their body and face), no major persecutions were recorded by contemporary chroniclers (Cohn, 2018), and this despite the fact that the Roman emperor Marcus Aurelius Antoninus could have blamed it on Christians or foreigners. With the plague, the Roman Army was devastated. In addition, due to extreme labor shortages, wages increased. The Roman state and elite needed soldiers and laborers. This could explain why authorities became more tolerant during the period.<sup>4</sup>

The Plague of Cyprian was either smallpox or Ebola and mortality was high (Harper, 2017). Chroniclers around that time attributed the plague to natural causes, specifically “corrupted air” (Harper, 2017; Cohn, 2018). Until the 19th century, the dominant

<sup>4</sup> Marcus Aurelius’ “strategy for maintaining stability during the plague was not to blame any social group or foreigners” (Cohn, 2018). Subsidies were granted to help the poor bury their dead and slaves and foreigners were hired as soldiers.

**Table 1**  
Epidemiological characteristics of historical and more recent pandemics and scapegoating.

Epidemic	Location, Period	Disease	Mode of Transmission	Distressing Symptoms	CFR (%)	Mortality (%)	By Area	By Age*	By Class**	Explanation	Scapegoating Scenario
<i>Antiquity</i>											
1. Plague of Athens	City of Athens, 430–427 BC	Typhus?	Lice?	Rash all over the body	Up to 40	25	Cities	Adults?	All?	Naturalistic (bad air)	Non-
2. Antonine Plague	Roman Empire, 165–180 AD	Smallpox?	Droplets, body fluids?	Pustules all over the body	30–95	Up to 25?	All?	Children and adults?	All?	Naturalistic (bad air)	Non-
3. Plague of Cyprian	Roman Empire, 249–260 AD	Smallpox or Ebola?	Droplets, body fluids?	Pustules all over the body?	30–95 or 50?	?	All?	Children and adults?	All?	Naturalistic (bad air)	Non-
4. Justinian Plague	Roman Empire, 541–542 AD	Bubonic plague	Rat fleas	Buboes, necrosis of extremities	50–60	25–50	All?	All?	All?	Naturalistic (bad air)	Non-
<i>Pre-Industrial Period</i>											
5. Black Death	Western Europe mostly, 1347–1352	Bubonic plague	Black rat flea bites	Buboes, necrosis of extremities	70	40	All	All	All	Naturalistic (bad air) or water-poisoning conspiracy	(Very) Violent
6. Plague Recurrences	Western Europe mostly, 14th–17th centuries	Bubonic plague	Black rat flea bites	Buboes, necrosis of extremities	Lower	Lower than 40	Cities	All?	The poor	Naturalistic (bad air)	Mild
7. Syphilis	All of Europe, 15th–19th Centuries	Syphilis	Sexual	Lesions, localized rashes	8–58	Low	Cities	Adults	All?	Punishment for sins	Mild
<i>Industrial Era</i>											
8. Cholera Pandemics	Global, mostly 19th Century	Cholera	Water (fecal-oral route)	Violent diarrhea/vomit, blue skin	50	High	Cities	Children	The poor	Naturalistic (bad air) or water-poisoning conspiracy	Violent
9. Smallpox Outbreaks	Global, mostly 19th Century	Smallpox	Droplets, body fluids	Pustules all over the body	30–95	Up to 25?	All?	Children	The poor	No inoculation / no access to vaccine	Violent
10. Yellow Fever Outbreaks	Global, mostly 18th–19th Century	Yellow Fever	Mosquito bites	Jaundice, vomiting blood	7.5–50	High	All?	Older adults	All?	Poor hygiene	Non-
11. Third Plague Pandemic	Global, mostly 1894–1901	Bubonic plague	Rat flea bites	One bubo, some necrosis	30–60	Low	Cities	All?	All?	Poor hygiene first, then rats	Violent
12. 1918 Influenza	Global, mostly 1918–1920	Influenza	Droplets	–	> 2.5	2.1	Cities	W shape	The poor	Influenza	Mild
<i>Recent Pandemics</i>											
13. HIV Crisis	Southern Africa, Global, 1980s–	HIV	Sexual	Rash, Kaposi's sarcoma	80–90	High	Cities	Adults	The poor	HIV	Mild
14. Ebola Outbreaks	West & Central Africa, 2010s–	Ebola	Body fluids	Vomiting blood	50	Low	Cities	Children, older adults	The poor	Ebola	Violent
15. COVID-19	Global, 2019–	Influenza	Droplets	–	5	0.006	Cities	Older adults	The poor	COVID-19	Depends

\* For a given area.

\*\* For a given area and a given age category.



theory of why infectious diseases existed was the miasma theory according to which diseases were caused by poisonous vapors (Last, 2007).<sup>5</sup> Such vapors were thought to come from rotting organic matter (e.g., corpses that were neither buried or cremated) in rivers and overcrowded areas with poor hygienic conditions, while extreme winters or summers made the “bad air” worse. The same was said of military sieges.

Finally, the Plague of Justinian (541–542) killed 25–50 percent of the population of the Mediterranean basin. The bubonic plague was a particularly lethal and frightening disease. CFRs in the pre-modern era were 50–60 percent (Benedictow, 2005; Benedictow, 2010). Symptoms included the formation of large buboes as well as necrosis of fingers, toes, the nose, and lips. Major episodes of bubonic plague were caused by the bacterium *Yersinia pestis* which was transmitted by the fleas of the black rat.

Crops went unharvested and herds untended, food was exhausted, and urban economic activities collapsed (Little, 2008). In the medium run, wages increased (The, 2018). Authorities initially tried to prevent any improvement in the bargaining power of workers (Little, 2008). At the same time, Justinian “stepped in, sending the military to assist civilians and to distribute money to them” and “gave from his own purse to ensure that piles of the plague dead would be buried” (Cohn, 2018). Foreigners were invited to settle in what were then the border provinces of the Empire, for example Lombards – a Germanic people – in present-day Lombardy, and Arabs in Roman Syria (Little, 2008). As such, because the plague was explained by “bad air” (Cohn, 2018), the elite did not blame particular groups. If anything, acute labor shortages implied that migrants needed to be better integrated.

### 3.3. The Black Death

The Black Death (1347–1352) killed 40 percent of the population of Europe (Benedictow, 2005; Benedictow, 2010). Medical knowledge was rudimentary and the medical profession did not understand the role of black rat fleas in spreading the disease. Prevention measures were non-existent: the practice of quarantine was not employed until 1377 (Gensini, Yacoub, & Conti, 2004). The Black Death's symptoms were apparent and alarming– black buboes would form all over the body and extremities would turn black – and its CFR was very high, at 70 percent. Death rates were similar across groups (Christakos, Olea, Serre, Hwa-Lung, & Wang, 2005).

European economies were severely affected (Jedwab, Johnson, & Koyama, 2020a; Jedwab et al., 2020b). In rural areas, harvests went uncollected (Robbins, 1928), and food prices increased (Munro, 2003). In cities, trade was disrupted (Nicholas, 1999; Hohenberg, 2004). Due to labor shortages, nominal wages increased (Routt, 2018). Real wages, however, rose only gradually, once the inflationary pressures induced by supply chain disruptions subsided. Authorities also tried to limit wage demands (Routt, 2013).

Following the plague numerous localities encouraged migration by giving immigrants citizenship rights, tax exemptions, housing, etc. (Byrne, 2012). In urban areas, the wealthy needed servants and sectors needed craftsmen. In rural areas, landowners needed tenants. As a result, “the first few years after the epidemic witnessed especially high migration rates” (Poos, 1991).

During the epidemic itself, the plague was initially attributed to the “vengeance of God” or the “conjunction of certain stars and planets” that caused “bad air” (Horrox, 1994). However, the plague was eventually attributed to the poisoning of wells by Jews, which led to mass expulsions and murders.

*Scapegoating Effect.* Why were Jews blamed? It was the apocalyptic scale of the plague that caused individuals, who already suspected Jews of conspiring against Christians, to blame them for causing the plague (Moore, 1987). In addition, people resented the fact that Jews specialized in moneylending and charged high interest rates. Jews also worked as tax collectors, and people resented the high taxes they were paying. Finally, many doctors in Medieval times were Jewish, giving rise to suspicions regarding their knowledge of poisons. This suggests that the probability of persecuting the Jews was likely to increase with plague virulence. Studies point to the plague as a direct cause of unprecedented scapegoating of Jewish communities (Cohn, 2007; Cohn, 2018; Voigtlander & Voth, 2012).

*Complementarity Effect.* In aggregate, the scapegoating effect dominated the unifying incentives, and complementarities effects. Yet, locally, Jedwab, Johnson, and Koyama (2019) find strong evidence for the complementarities effect, in that higher-mortality cities persecuted their Jewish community less, not more. Jews played a vital role in relatively high-skilled trades such as money-lending and trade, and the economic value they generated was clearly recognized (Chazan, 2010). This was especially likely to confer protection in cities that relied on special taxes paid by Jews (Johnson & Koyama, 2019). What is more, many cities took extra steps to protect their Jewish quarters against mob violence (Rowan, 1984; Wasserman, 2007). Jedwab et al. (2019) indeed find stronger protective effects in cities where Jews were moneylenders and important merchants.<sup>6</sup>

### 3.4. Plague recurrences

Subsequent outbreaks of bubonic plague reoccurred for a few centuries following the Black Death (Boris et al., 2015). In general, only a few cities at a time were affected, and mortality was much lower than in the initial pandemic (Aberth, 2010). In addition, the poor were now disproportionately affected (Alfani & Bonetti, 2019).

Cohn (2018) argues that subsequent plague outbreaks led to more compassion. First of all, plague epidemics led to peace movements and the constitution of organizations that provided for the poor. Bornstein (1993) describes how the religious movement “The Bianchi” that emerged in Florence in 1399 called for peace between warring Italian cities and convinced many to help the poor. Second, when plague recurrences did cause accusations of “plague spreading”, it was later in the 16th and 17th centuries, but neither the Jews nor the poor were targeted. If anything, accusations of plague spreading increasingly focused on people who financially benefited from plague outbreaks lasting longer, such as workers who removed corpses during plague events or the members of city health boards and physicians (Davies, 2016). Such conspiracies led to the arrest and execution of “plague greasers”, but victimization in these cases was limited to a few individuals (Cohn, 2018).

### 3.5. Syphilis

The first recorded syphilis epidemic took place in Naples after it was invaded by French troops in 1494–1495, and it thus became known as the “French disease”. Syphilis is transmitted by sexual

<sup>6</sup> Jedwab et al. (2019) find that Jews were also more likely to be persecuted in towns where people were inclined to believe antisemitic canards as measured by past antisemitic actions. From the 12th century onwards Jews were accused of ritually murdering Christian children. They find that the protective effect of high mortality was attenuated for towns closer to where such accusations were made. The protective effect was also weaker in cities first infected during Christmastide and Easter – when Christians blamed Jews for the death of Jesus – and stronger for Advent and Lent – when Christians were doing penance.

<sup>5</sup> *Miasma* means bad air in Greek and bad air is *malaria* in Italian.

contact with the infectious lesions of another person. Infected individuals initially develop skin ulcerations and a rash. Eventually, they experience non-cancerous growths and neurological or heart problems (Kent & Romanelli, 2008). If untreated, it has a mortality rate between 8 and 58 percent (Ibid). Because it was sexually transmitted, it was associated with prostitution (Craddock, 2004). In addition, invading armies and migrants were often spreaders of syphilis, which was seen as a disease of foreigners.<sup>7</sup>

Cohn (2018) explains that people saw the disease as “God’s punishment of sin”, since it was associated with sexual activities that were frowned upon by the Church, but also because stars and planets were misaligned.<sup>8</sup> Consequently, infected individuals were either not responsible, or if they were responsible it was because they had sinned. Second, Cohn (2018) argues that naming is not blaming. Even if syphilis was called the French disease, it did not lead to the persecution of French individuals. Third, while authorities criticized the existence of houses of prostitution, syphilis epidemics did not cause the persecution of sex workers. Fourth, the persecution of female sex workers began only after the first effective treatment for syphilis was discovered in 1909. Indeed, once a treatment became available, women who still had syphilis came to be seen as “guilty” (Cohn, 2018).

### 3.6. The cholera riots

Cholera began to spread to North America and European cities from 1826 (Clemens, Balakrish Nair, Ahmed, Qadri, & Holmgren, 2017). It then became a global pandemic, with each outbreak killing several hundred thousand people. Indeed, cholera had a very high CFR of 50 percent in the 19th century. At the time, cholera disproportionately killed children and the poor (Ali et al., 2012; Clemens et al., 2017). It is a water-borne infectious disease, meaning it is transmitted through the fecal-oral route of contaminated water.<sup>9</sup> Understanding and controlling cholera outbreaks became particularly important in the fast-growing, and thus congested and poorly infrastructure-endowed, cities of Industrial Europe and North America.<sup>10</sup> Finally, the symptoms of cholera are particularly frightening, such as violent diarrhea and vomiting of a clear fluid that looks like “rice water” and also because the skin turns bluish-gray.

After the second cholera pandemic of 1826–1837, doctors and authorities believed the disease came from people living in poor environments. When the third cholera pandemic spread in the U. S. in 1849, it was believed that the disease was brought from Europe by Irish immigrants fleeing the potato famine (Rosenberg, 1987). The prevalent “miasma theory” of the times ascribed the source of cholera to bad airs. However, in the 1850s, the germ theory of disease became more established (Mokyr & Stein, 1996). In 1857, a discovery by the London physician John Snow changed the way people thought about water and the propagation of disease.<sup>11</sup>

Few other diseases such as cholera “triggered violence even after their agents and mechanisms of transmission had become well known” (Cohn, 2012). Indeed, violent “cholera riots” took

place in many cities of various industrializing nations throughout the 19th century (Cohn, 2012; Cohn, 2017). Cholera disproportionately killed the urban poor, especially children, and life in 19th century industrial cities was dominated by a constant, and already violent, class struggle between the bourgeoisie and the proletariat. In addition, measures to contain cholera outbreaks (quarantines, checkpoints, etc.) disproportionately affected the economic livelihoods of the urban poor who, in European cities, were migrants from rural areas. In U.S. cities, many of them were recent immigrants.

Violent cholera riots took place in British towns in 1831–1832, especially as the population believed “elites with physicians as their agents had invented the disease to cull populations of the poor” (Cohn, 2018). Thirty years before, Thomas Malthus wrote *An Essay on the Principle of Population* in which he criticized the working class’s tendency to reproduce rapidly. Throughout the early 19th century, British politics was dominated by Malthus’ ideas such as the question of whether poverty relief created a vicious cycle by encouraging the poor to be idle and reproduce instead of working. In addition, the population believed doctors and hospitals were scheming to exterminate their patients so as to sell their bodies to medical schools. In 1828, three years before the riots took place, two individuals were charged with murdering sixteen people in order to supply a doctor with bodies for his anatomy lectures. As Cohn (2018) explains, the “trial filled British newspapers, and remained alive in the minds of the poor when cholera reached Britain.” Likewise, authorities buried cholera victims rapidly, and in separate cemeteries, which infuriated populations because victims were not given a decent burial. Riots broke out in industrializing cities with high shares of impoverished migrants. Doctors and hospitals were violently attacked.

Violent riots also took place in Russian cities when the second pandemic reached in 1830–1831. 100,000 members of the “lower classes” died and “rumors that the aristocracy and upper classes were responsible for the plague set off insurrections” (Bosin, 2009). “The rumor that doctors poisoned the wells sparked a wave of bloody riots throughout Russia, with large crowds sacking affluent households, smashing quarantines, and killing medical personnel.” Cholera riots re-occurred frequently after that.

Finally, riots also occurred in China in 1892. In the 19th century and after a series of military defeats, the Qing Dynasty granted territorial concessions to various colonial powers. In the concessions, Chinese individuals were treated as second-class citizens. Unsurprisingly, most of the riots that took place that year targeted Westerners, who were accused of poisoning wells (Cohn, 2018).

Cholera led to similarly violent riots in other countries throughout the 19th century. Cohn (2017) then explains that rumors were more likely to spread and revolts be violent “where elites continued to belittle the supposed ‘superstitions’ of villagers, minorities, and the poor, violated their burial customs and religious beliefs, and imposed stringent anti-cholera regulations even after most of them had been proven to be ineffectual.”<sup>12</sup>

### 3.7. Smallpox outbreaks

Smallpox particularly impacted North American cities in the 18th and 19th centuries. Smallpox was lethal, especially for children, could be transmitted in various ways (droplets, body fluids,

<sup>7</sup> It was “the Neapolitan disease outside Naples, the French disease outside France, the Polish disease in Germany, the German disease in Poland [...]” (Cohn, 2012).

<sup>8</sup> Syphilis means “swine love” in Greek (Taubenberger & Morens, 1918), reflecting its association with sexual promiscuity (Tannenbaum, 1918).

<sup>9</sup> Cholera epidemics have become much less lethal in the 20th century, thanks to improved sanitation and improved access to clean water (Cutler & Miller, 2005).

<sup>10</sup> For example, Chicago lost one-twentieth of its population in 1854 (Ashraf, Glaeser, & Giacomo, 2016).

<sup>11</sup> Using observational statistics and a “Ghost Map”, he traced the deaths from the cholera epidemic that swept London in 1854 to a sewage-contaminated water pump used to supply household water. In this way, John Snow demonstrated that cholera epidemics were due to water sources being contaminated with human waste (Ambrus, Field, & Gonzalez, 2020).

<sup>12</sup> Cholera riots continued even after the mode of transmission of cholera was identified, because of the establishment’s reluctance to cater to the needs of the poor and due to distrust in the motives of the government. Over time, cholera riots changed from being against government controls to being in favor of such controls (Cohn, 2018). In Italy in 1884, people “protested against authorities’ laxity in handling the cholera outbreak.”

objects), and exhibited distressing symptoms (pustules all over the body and face).

Smallpox caused class conflict, but this time the poor and diseased victims were scapegoated (Cohn, 2018). Indeed, inoculation for smallpox was adopted as a practice as early as the 18th century and a vaccine was developed in 1796 (Wolfe & Sharp, 2002). Smallpox victims were found among the poor and were seen by the elite as “guilty” for their infection. Since smallpox epidemics forced governments to adopt economically harmful quarantine measures, property owners, merchants, and local authorities were the ones targeting the poor and diseased victims.<sup>13</sup>

Smallpox hospitals and victims were targeted by violent mobs. For example, the New York Marine Hospital in Staten Island was the largest quarantine facility in the U.S. in the 1850s. Because residents believed the facility was responsible for local smallpox outbreaks, which then harmed property values, 32 buildings were burned by a mob (Stephenson, 2004). In Montreal in 1885, English papers blamed smallpox outbreaks on French-Canadians because of their ‘filthy customs’ and ‘ignorance of vaccination’ (cited in Cohn, 2018). Compulsory vaccination in French areas then sparked riots against “health authorities, the police, mayor, and [...] the military”.

### 3.8. Yellow fever outbreaks

Originating from Africa, yellow fever is a virus spread by the bite of an infected *A. aegypti* mosquito. The role of mosquitoes as a carrier of the disease was not understood until the late 19th century. Before that time, yellow fever had relatively high CFRs (between 7.5 and 50 percent) and was seen as a dangerous disease (Tomori, 2004; Oldstone, 2012). Yellow fever epidemics were particularly frequent in the Americas, including in the South of the U.S. where it killed 100,000–150,000 people during the 19th century (Patterson, 1992). In 1793, yellow fever killed 9 percent of the population of Philadelphia (Miller, 2005). New Orleans was also repeatedly plagued by the disease. In Memphis in 1878, 70 percent of whites who remained in the city once a yellow fever epidemic broke out perished (Cohn, 2018). Yellow fever disproportionately kills older adults in more urban areas (Humphreys, 1999; Blake & Mariano, 2014).<sup>14</sup> It is accompanied by severe fever, jaundice (the skin and whites of the eyes turn yellow), bleeding through the mouth, nose and the eyes, and the vomiting of blood.

Cohn (2018) documents how the yellow fever epidemic of 1793 in Philadelphia did not lead to social conflict. In particular, African Americans, who possessed greater immunity to it because their African ancestry and greater historical exposure (Blake & Mariano, 2014), were not blamed. Likewise, when yellow fever hit New Orleans in 1853, poor Irish immigrants who were greatly affected were not blamed. African Americans were again not blamed (Carrigan, 1961).

Cholera and yellow fever are both lethal, killed the urban poor, were mysterious for most of the 19th century, and had frightening symptoms. Why did yellow fever not lead to riots? One possibility is that cholera disproportionately killed children, whereas yellow

fever killed older adults. Another possibility that could explain why African Americans were not blamed is because they became more valuable due to their immunocapital (Olivarius, 2016). Many were slaves in plantations. In cities, sick White residents needed African Americans to help with domestic tasks and businesses.

### 3.9. The Third plague pandemic of 1894–1901

The Third Plague Pandemic was a milder form of bubonic plague than the Black Death, as it killed between 30 and 60 percent of infected and untreated individuals (WHO, 2020b). In most cases, infected individuals had only one bubo found in the groin.

In India, where it killed 1 million people, the plague led to violent riots in 1896–1898, but as a result of heavy-handed and inefficient policies adopted by British colonial authorities. Severe quarantine controls were imposed, infected individuals were taken to segregation camps and their houses and belongings burned, religious temples and cemeteries were closed, and male doctors forcibly examined women against the will of their communities (Cohn, 2018). The policies also had a pronounced class bias in the urban context. This was borne out of the belief that the urban poor, and not the “respectable class” of Indians, were the vectors of disease spread in cities. Hundreds of huts were razed to the ground in the poor neighborhoods of Bombay (Kidambi, 2004). There were first peaceful protests organized against what people saw as abusive policies by colonial authorities. However, as the protesters’ pleas for more respectful control measures were ignored, riots emerged in Indian cities. Medical workers and British officers and hospitals and government buildings were attacked.

Interestingly, protests against colonial policies did not lead to a backlash against Western medicine (Cohn, 2018). The bacterium for the plague, *Y. Pestis*, and its mode of transmission via the bites of rat fleas, were discovered in 1894. The Indian press was aware of these discoveries and asked British authorities to be more “scientific” in their control policies. Another interesting fact is that the plague unified Hindus and Muslims, as they joined mass protests against colonial authorities.

### 3.10. The 1918 Influenza

The 1918 Influenza (1918–1920) killed 2.1 percent of the world’s population (Barro et al., 2020). It was transmitted by breathing in droplets from an infected person coughing, sneezing, or talking. Its CFR was 2.5 percent (Taubenberger & Morens, 2006). The 1918 influenza disproportionately killed the “very young, those around age 30, and the elderly” (Almond, 2006; Beach, Clay, & Saavedra, 2020) and the poor (Mills, 1986; Mamelund, 2006; Mamelund, 2018). Comparing mortality rates across locations, the higher infection rates in more connected areas were compensated by higher infection fatality rates in less developed regions with poorer health infrastructure, generating a negative relationship between mortality and development (Barro et al., 2020; Beach et al., 2020). Its symptoms largely comprised standard influenza symptoms (Spinney, 2017).

By 1918, the germ theory of disease was already established. “Public health officials and many members of the public understood the importance of hand washing and covering the mouth and nose to reduce transmission of tuberculosis, a lesson that translated readily to influenza [and] schools had been closed and public gatherings had been limited before” (Beach et al., 2020). At the same time, the medical ability to respond to the 1918 Influenza was limited by a lack of knowledge about the virus, limited health care capacity, and the fact that antibiotics and vaccines did not exist yet (Jester, Uyeki, Jernigan, & Tumpey, 2019; Beach et al., 2020). Non-pharmaceutical interventions – school closures, quarantines, and bans on public assemblies – were implemented

<sup>13</sup> Various communities were scapegoated during the 1881 smallpox epidemic, especially individuals of Chinese origin as it was believed that smallpox came from China. Why this group in particular? Natives saw Chinese immigrants as an economic and cultural threat. Anti-Chinese sentiment grew, and the Page Act of 1875 prohibited the entry of Chinese women whereas the Chinese Exclusion Act of 1882 prohibited all immigration of Chinese laborers. Chinese immigrants were then forced to live in ghettos, “Chinatowns”. Because such areas were overcrowded, they may indeed have exhibited higher smallpox rates. Cohn (2018) also describes how smallpox outbreaks were also blamed on “immigrant trains” in California.

<sup>14</sup> Uncovered water installations in informal urban areas and repeated floodings due to poor drainage provide breeding grounds for mosquitoes. Rural areas close to bayous as in the U.S. South could also be severely affected.



(Markel, Lipman, Alexander Navarro, Sloan, Michalsen, Stern, & Martin, 2007; Jones, 2010), but often in a haphazard way (Clay, Lewis, & Severnini, 2018; Barro, 2020).

Barro et al. (2020) show how countries that experienced higher mortality rates saw their economy collapse. They find some evidence for recovery, but the estimated effects are not significant. In the US, the pandemic killed 0.5–0.8 percent of the population and led to a historic downturn in the economy (Beach et al., 2020). However, the pandemic only led to a brief V-shaped recession (Velde, 2020).

The 1918 Influenza was historically called the ‘Spanish flu’. However, naming is not necessarily blaming. The 1918 Influenza led to few cases of scapegoating. Collier (1996), Crosby (2003), and Cohn (2018) describe how, in the face of collapsing public services, the 1918 Influenza led to compassion and self-sacrifice by both individuals and entire communities.

According to Cohn (2012), the fact that the 1918 Influenza “provoked no major riots or religious and sectarian hatred is more remarkable still” given the fact that “the pandemic exploded in the midst of war frenzy and heightened nationalistic hatreds”. Anti-migrant sentiment was also particularly rife in the US, as politicians and the public criticized shifts in immigrants’ origins from Northern and Western Europe to Southern and Eastern Europe as well as Mexico and Asia (Jaret, 1999). Actually, the 1918 Influenza brought native and migrant communities together, as shown for the US by Kraut (2010). In particular, city authorities often worked hand in hand with community leaders to convince migrant communities to follow the health guidelines they adopted.

### 3.11. The global spread of HIV

HIV is spread sexually and its CFR without antiretroviral therapy (ART) is 80–90 percent ten years after the infection. In the 2000s, about 25 percent of pregnant South Africa women had HIV, and the share of infected individuals who had access to ART was below 20 percent for most of the decade (South Africa, 2011). HIV is dominantly a trade-related and urban disease (Oster, 2012; Djemai, 2018), and within urban areas poorer residents have higher prevalence rates (CDC, 2016).

Since HIV disproportionately kills sexually active (i.e., working-age) adults, Weil (2010) explains how HIV impacts growth by increasing dependency ratios and Young (2005) describes how HIV has a negative impact on the human capital accumulation of orphaned children. At the same time, if individuals are less willing to engage in unprotected sexual activity, or if labor scarcity increases the value of a woman’s time, increased HIV prevalence could lower fertility, which could permanently increase incomes per capita. Young (2005) simulates the impact of the AIDS epidemic on living standards in South Africa and finds that the positive fertility effect dominates the negative human capital effect, meaning that per capita incomes increase on average.<sup>15</sup>

The spread of AIDS in the 1980s led to the scapegoating of groups in which the disease was said to be more prevalent. HIV was initially called the “4H disease” by officials of the U.S. Center for Disease Control, because the disease seemed to disproportionately affect heroin users, homosexuals, hemophiliacs, and Haitians (Gilman, 1987). In Africa in the 2000s when the disease was still relatively unknown, there were many cases of targeted violence where infected individuals would be murdered (Iliffe, 2005; Cohn, 2018). Persons living with HIV still suffer from discrimination today. Chin (2013), finds that HIV increases intimate partner violence. Likewise, because homosexuality is associated with HIV,

LGBT people are often discriminated against (Badgett, 2014). Yet, HIV did not lead to “riots and collective acts of physical violence” (Cohn, 2012).<sup>16</sup>

### 3.12. Ebola

10,000 people died during the 2014–2016 Ebola Outbreak in West Africa (0.04 percent of the total population of Guinea, Liberia and Sierra Leone) and 2500 people have died so far since the Kivu Ebola Epidemic broke out in 2018 (0.003 percent of the population of the Democratic Republic of the Congo). Ebola is a threatening disease due to its high CFR (50 percent) and the fact that it can spread through any body fluids, whether saliva, mucus, feces, sweat, tears, urine or semen (WHO, 2020c). While Ebola outbreaks start in rural areas, the fact that it spreads through body fluids makes it dangerous for cities (Zinszer, Morrison, Verma, & Brownstein, 2017). Thus, slum areas with worse sanitation facilities, “poor health infrastructure, lack of health education, and inadequate government-enforced quarantine” act as Ebola hotspots (Snyder, Marlow, & Riley, 2014). Young children are the most likely to die, and adults tend to die more than older children (WHO Ebola Response Team, 2015, 2015). Symptoms include severe diarrhea, vomiting, and hemorrhaging.

The economic impact of Ebola was important for the affected economies (Huber, Finelli, & Stevens, 2018). Food production decreased (de la Fuente, Jacoby, & Lawin, 2020), and there was a significant decline in foreign direct investment, tourism, and trade. Urban sectors were particularly affected as a result of strict lockdown measures adopted by authorities (Bowles, Hjort, Melvin, & Werker, 2016).

Ebola outbreaks have led to localized but nonetheless violent attacks against health and government officials and Ebola clinics (The Washington Post, 2015; The Washington Post, 2019). Health and government workers were murdered by protesters. In other cases, health and government workers were attacked for spraying disinfectants (The New Yorker, 2014). The lack of communication by authorities and the fact that many local young people already felt excluded from economic opportunities led many of them to violently protest about such operations. In addition, Ebola victims were rapidly buried by authorities without taking into account cultural and religious considerations, which incited protests (Manguvo & Mafuvadze, 2015). International organizations are now pushing for “safe and dignified burials”.

Distrust in the government, the health sector, and foreign aid agencies already existed prior to the outbreaks. Instead of engaging communities and building trust, economically harmful containment efforts were imposed with a top-down approach, which led to a backlash against the authorities (Cohn & Kutalek, 2016). Thus, rumors spread that government agencies and international organizations planned the outbreak and that the organs of the dead were harvested and sold (Hayden, 2019).

## 4. Summary of the Scapegoating-Epidemic relationship

In this section, we use the historical evidence from the previous section to discuss the scapegoating-epidemic relationship more generally. Subsections 4.1 and 4.2 examine *broader aspects* of the relationship. Subsections 4.3–4.5 investigate the role of specific *epidemiological characteristics* – the overall mortality rate (how many people die), the distress caused by the symptoms (how “frightening” the epidemic is), and the selectiveness of mortality

<sup>15</sup> Bloom and Mahal (1997) and Fortson (2011) find similar results. It might be that the negative individual, household, and firm level effects estimated in the literature are compensated by positive effects at the sector or national level (Mahal, 2004).

<sup>16</sup> In the 1990s in Apartheid South Africa and in other African countries and Haiti, rumors claimed that the white had created the disease to convince Africans or Haitians to have sex less often, and thus fewer kids (Cohn, 2018).

(who dies) – in the likelihood that an epidemic leads to scapegoating. Subsections 4.6–4.8 examine the role of more *contextual characteristics* – the average level of knowledge about the disease, cultural differences, and the socio-political context.

#### 4.1. How often did epidemics lead to Scapegoating?

The Black Death led to the mass persecution of Jews, and the Cholera, smallpox, and plague riots of the 19th century and the Ebola outbreaks of the 20th century led to organized attacks against health and governments officials, which we refer to as the *violent scapegoating scenario* here. Other outbreaks – plague recurrences, syphilis, the 1918 Influenza and HIV – did not cause large-scale and systematic social conflict, but rather led to what we refer to as the *mild scapegoating scenarios*. In these situations, the blaming of minority groups led to cases of medicalized prejudice, discrimination, and individual cases of targeted violence. Finally, the plagues of Antiquity and the yellow fever outbreaks of the 18th and 19th centuries did not particularly lead to scapegoating, which is referred to as the *non-scapegoating scenario*.

Table 1 lists the nine out of the fourteen epidemics discussed in this paper that led to scapegoating. Among these, about half of them were cases of violent scapegoating.

There are also many cases in which epidemics led to greater compassion and increased social cohesion. It could be that the scapegoating effect was not as strong as would be expected and/or that the social bonding, labor scarcity and complementarities effects were stronger than expected.

To rigorously examine the causal link between epidemics and social conflict, one would need more comprehensive data on all outbreak events that ever took place and data on all occurrences of social conflict before and after these crises. In the absence of such data, below we examine some possible channels that may have determined the likelihood of conflict over the broader course of history.

#### 4.2. How did the relationship change over Time?

The plagues of Antiquity did not cause scapegoating. They have in common that contemporaries explained them by natural causes. Most violent cases of scapegoating took place between the 14th and 19th centuries, which were times of great social upheaval. The Black Death was particularly violent. However, it was followed by two much milder cases of scapegoating. Indeed, subsequent plague recurrences until the 17th century and syphilis from the 15th to the 19th centuries led to cases of medicalized prejudice, discrimination, and/or individual cases of targeted violence, but not collective violence. Epidemics that emerged in the 19th century – cholera, smallpox and the plague – led to violent riots. Yellow fever, which was important in the 18th and 19th centuries, did not lead to scapegoating. Finally, epidemics have since then led to “milder” cases of scapegoating.

Overall, it appears that the scapegoating-epidemic relationship followed an inverted-U shape over time. In particular, conspiracy theories played a particularly important role in the epidemics of the 14th–19th centuries. Other factors, for example whether governments were non-benevolent and adopted heavy-handed and counterproductive disease control policies, also mattered.

In the next three subsections, we discuss the role of epidemiological characteristics.

#### 4.3. Did Higher-Mortality epidemics lead more often to Scapegoating?

With the exception of the Black Death, the deadliest epidemics did not lead to violent scapegoating (the plagues of Antiquity), but did lead to the “mild” scapegoating scenario on occasions (HIV).

This suggests that high-mortality epidemics may increase the need for social bonding. In addition, high-mortality epidemics raise wages due to labor scarcity and may make the labor supply of minority groups particularly valuable.

During the plagues of Antiquity, some evidence can be found for both the social bonding and labor scarcity effects. The Black Death may be the exception that confirms the rule. It had the highest overall mortality rate of all epidemics and it led to mass persecutions. However, wages did not increase right away. In addition, cities that experienced higher mortality rates persecuted their Jewish community less, not more. In this case, labor scarcity and economic complementarities were the determining factors. Yellow fever outbreaks were at times particularly deadly for some U.S. cities. However, yellow fever outbreaks did not lead to violent riots like cholera or smallpox outbreaks did. African Americans were affected much less than White Americans. Yet, they were not overtly scapegoated, because their immunocapital made them particularly valuable for the slave-based economy. Finally, as HIV spread in South Africa, it might have not been so harmful to the economy.

Overall, with the exception of the Black Death, it does not appear that higher-mortality epidemics led to more social conflict than lower-mortality epidemics.

#### 4.4. Did more frightening diseases lead more often to Scapegoating?

Many violent epidemics were caused by diseases with distressing symptoms that were hard to conceal. The Black Death caused black buboes all over the body and blackened the extremities. Cholera was frightening, with people having “rice water” coming out of their body and their skin turning blue. Smallpox caused disgust, with pustules and scabs all over the body. Ebola also shows frightening symptoms, as blood comes out of all openings in the body. In the cases of the Black Death, cholera, and Ebola, there have been conspiracy theories that specific groups were using poison to eliminate other groups.

Overall, it appears that more frightening diseases indeed led to more scapegoating. At the same time, the Justinian Plague was a bubonic plague and yellow fever was also seen as a terrifying disease as skin turned yellow and people vomited blood, but these pandemics did not lead to scapegoating. In these cases, the effects of other factors such as mortality may have dominated.

#### 4.5. Did the selectiveness of mortality matter for the likelihood of Scapegoating?

Most epidemics disproportionately hit cities, possibly because population density and connectedness were important factors of contagion. Based on the available data in Table 1, epidemics appear to have disproportionately killed the urban poor (for a given age category). Two likely explanations for this are that the urban poor live in overcrowded and unsanitary areas, and the poor may have other comorbidities.

Is social conflict more likely to occur when the “poor” disproportionately die? The poor live close to the subsistence level so epidemics may increase stress levels for these populations. Second, high levels of inequality feed feelings of “relative deprivation”, which may erupt in epidemic times. Third, the poor are more likely to die when an epidemic hits, which reinforces feelings of “relative deprivation”. Fourth, governments may adopt heavy-handed disease control policies that disproportionately harm the poor. If these policies are not implemented with the support of important actors in the poor’s communities, or if they are not meant to reduce mortality in poorer areas but protect richer areas against contagion from poorer areas, they will be seen as exclusionary. The poor also experience higher levels of chronic stress. If the poor do not have a

voice, there is a higher risk that epidemics lead the poor to riot against the government (or aggress minority groups if the government is too powerful). Fifth, the poor are more numerous than the rich. As such, they are capable of forming mobs.

During the cholera, plague, and Ebola riots, such protests turned violent because the authorities implemented policies that were economically harmful and caused mistrust. In the cases of cholera and Ebola, conspiracy theories arose suggesting that richer segments of society were using the epidemic and the apparatus of government and medical systems to eliminate the poor.

Lastly, evidence suggests that epidemics that disproportionately kill children are more likely to induce violence against the presumed perpetrators. If diseases kill working-age adults, this contributes to labor scarcity and wages increasing and if they fall sick, they may also be less able to persecute others. Likewise, diseases that kill the elderly reduce dependency ratios. Epidemics that kill children also lower dependency ratios. However, one could argue that the loss of children triggers a stronger emotional reaction from working-age adults because it seems less “natural” than losing older relatives.<sup>17</sup> Cholera, smallpox, and Ebola disproportionately kill children and they all led to violent forms of scapegoating.

Overall, it appears that the class- and age- selectiveness of mortality played a substantial role in scapegoating. In the next three subsections, we discuss the role of other more contextual characteristics.

#### 4.6. Did the average state of medical knowledge in society matter for the likelihood of Scapegoating?

Until the late 19th century, the dominant theory for why epidemics happened was the miasma theory according to which “bad air” caused people to be sick. As such, specific groups were less likely to be blamed.

Poison became a major form of killing in the Medieval and Renaissance periods (Wexler, 2017), as the Islamic Golden Age (8<sup>th</sup>–14<sup>th</sup> centuries) contributed to major advances in pharmacology (Hadzovic, 1997). Apothecary shops were open throughout the Middle East and Europe. While such shops sold remedies, they also sold poison. Unsurprisingly, epidemics during this period became increasingly associated with accusations of poisoning.

When the germ theory of disease became more established, some epidemics still led to scapegoating, especially against disease victims. In the case of the smallpox epidemics of the 19th century, a vaccine already existed in 1796. Victims were blamed because they were viewed as “guilty”, either because of their ignorance or their lack of consideration for the rest of society. Likewise, it is only when a treatment became available for syphilis in 1910 that women who still had syphilis came to be seen as “guilty”.

Finally, by the time of the 1918 Influenza and HIV epidemics, the likelihood of scapegoating had decreased as the determinants of epidemics became more widely understood. Governments and populations also increasingly realized that exclusionary policies against the diseased and/or minorities, or policies that are not inclusive of them, could have counterproductive effects as it was the case for the 1918 Influenza, HIV and Ebola. In contrast, Ebola outbreaks, which led to acts of violence, have occurred in some of the poorest places on earth, where lack of access to education and unbiased information are quantitatively important and distrust in authorities widespread and entrenched.

<sup>17</sup> The value of statistical life measures how much people are willing to pay to avoid their own death or the death of other people. Such values are higher for children (Zinszer et al., 1994, Andersson & Treich, 2011, Balmford, Bateman, Bolt, Day, & Ferrini, 2019) because “parents are usually more concerned about the mortality and morbidity risks of their children than for themselves” (Leung & Guria, 2006; Vyborny, 2021).

Overall, it seems that there is an inverted U-shape relationship between the average level of epidemic knowledge in society and the likelihood of scapegoating.

#### 4.7. How did knowledge and cultural differences contribute to the likelihood of Scapegoating?

So far, we only considered the impact of the average level of medical knowledge in a society. This is implicitly the power-weighted mean level of knowledge in a society, thus aggregating knowledge levels across all individuals, also taking into account their relative “power” in the society (for example, leaders and bureaucrats have more power because they enact and apply laws).

However, two societies with the same *mean* level of knowledge could experience different levels of scapegoating depending on the “distribution” of that knowledge within society.

When minority segments of the population had lower access to medical knowledge than the majority and the elite, and facilitated epidemic transmission as a result, they were more likely to be scapegoated by both the majority and the elite. This was for example the case with uninoculated smallpox victims and sex workers affected by syphilis. Migrants were blamed too in various cases because they move more and often live in overcrowded areas.

In other cases, an impoverished majority had lower access to epidemic knowledge than the elite or the minority itself, as was the case during the Black Death during which many city leaders and Jewish doctors tried to convince mobs that the plague was not due to Jews poisoning wells. In the case of cholera and Ebola, an impoverished majority attacked government and health workers and members of the economic elite, accusing them of using the epidemics to eradicate the poor. Mistrust of authorities by the majority implied that existing scientific knowledge was less likely to percolate and thus had a lower mitigating impact overall.

Likewise, cultural differences, whether due to racial, religious or social differences, should matter because they could constrain the diffusion of epidemic knowledge more broadly, making it more likely that a minority (or majority) has lower access to epidemic knowledge than the majority (minority) and members of the government or health sector. This would then impact the likelihood of scapegoating for a given average level of scientific knowledge in society.

In addition, some religious or migrant communities may decide that science-based recommendations to control an epidemic go against performing certain actions that are particularly important for the practice of their faith or their economic survival. In that case, their members may ultimately choose to place their religion or economic survival “above” scientific knowledge. This might in turn lead to their scapegoating by other groups or the government. In such cases, the buy-in of community leaders is crucial for successful epidemic control measures as they can convince their own communities, as was the case of the U.S. during the 1918 Influenza.

#### 4.8. Social and political contexts and scapegoating

Contexts where rife intergroup tensions already exist are more likely to see occurrences of scapegoating, as was the case during the Black Death (where non-Jews resented the presence of Jews), Europe’s Cholera riots (when the poor resented the disdain with which the elite treated them), Asia’s Cholera and plague riots (when natives resented the disdain with which colonial officers treated them), South Africa’s HIV epidemic (when Black South Africans resented the disdain with which White officers treated them during the Apartheid), and Africa’s Ebola outbreaks (when the poor resented the disdain with which the elite treated them). Yet, some epidemics united communities *despite* pre-existing tensions, for



example during America's yellow fever outbreaks (when there was widespread discrimination against African Americans), India's plague epidemic (between Hindus and Muslims) and the 1918 Influenza (between natives and migrants in the US).

More generally, more autocratic actions by not-necessarily benevolent governments contributed to social conflict during epidemics. During the Black Death, city leaders turned a blind eye to the persecution of Jews, or even organized them. Cholera, smallpox, the plague, and Ebola led to riots because of the distrust populations had toward authorities.

## 5. Epidemics and social conflict: Possible scenarios for COVID-19

We now discuss how COVID-19 differs from other epidemics and which cases and contexts led to scapegoating, for example as a function of its epidemiological characteristics.

### 5.1. How COVID-19 differs from other epidemics

COVID-19 spreads from inhaling respiratory droplets of infected individuals who are in close contact. The U.S. Center for Disease Control indicates a reproduction number ( $R_0$ ) of about 2.5 (CDC, 2020). Available estimates suggest a CFR of about 3 percent and an infection fatality rate (IFR) of 0.001–0.5 percent depending on age (CDC, 2020).<sup>18</sup> The elderly, males and individuals with pre-existing conditions and low access to health care have significantly higher IFRs.<sup>19</sup> Governments have adopted measures to reduce the effective reproduction number and avoid overcrowding their health system.<sup>20</sup> Thanks to these measures, COVID has killed only 0.04 percent of the world's population.

The economic crisis that the world is currently experiencing is similar to what happened during the 1918 Influenza. Since aggregate mortality is low, the labor scarcity effect is unlikely to be realized. Instead, the economy of developing countries could remain particularly disrupted for some time. However, the 1918 Influenza led to a quick V-shaped recovery. After the COVID-19 crisis ends, developing countries could experience a V-shaped or W-shaped recovery, which might also depend upon the availability of vaccines, especially in developing countries (World Bank, 2020).

### 5.2. Consequences for social conflict

We now describe various scapegoating cases observed since the beginning of the pandemic.

*People of Asian descent.* Reports suggest increased discrimination against people of Asian descent, in the U.S. (New York Times, 2020a, The Washington Post, 2020c, BBC, 2021) as well as in the rest of the world (Human Rights Watch, 2020). In particular, "people of Asian descent around the world have been subjected to attacks and beatings, violent bullying, threats, racist abuse, and discrimination that appear linked to the pandemic" (Ibid.).

*Religious Minorities.* The majoritarian bias of societies has increased hate and discrimination against religious minorities (Human Rights Watch, 2020). In South Asia, faith-based discrimination against Muslims has increased in India, Sri Lanka and Myanmar. In India, a large religious gathering organized by a religious

group emerged as a super-spreader event. The ensuing outrage calling for action against the organizers of the gathering, however, took a communal turn and the episode led to discrimination against Indian Muslims. There the media also report that there have also been riots during which gangs of young Hindu men attacked Muslim communities (The Guardian, 2020a).<sup>21</sup> Likewise, in Sri Lanka, Muslim religious practices were singled out as "super spreader events", Muslim shops have been boycotted, and cremations were made compulsory for all COVID-19 victims, which goes against the Islamic tradition of burying the dead (Al Jazeera, 2020a).<sup>22</sup>

*People of African origin.* In various Chinese cities, people of African origin have been forcibly tested for the coronavirus and ordered to self-isolate in designated hotels (Human Rights Watch, 2020). In other Chinese cities, African residents were evicted by landlords, and hotels, shops, and restaurants have refused to serve African customers (The Guardian, 2020b).

*Migrants.* Migrants have been blamed for being "super-spreaders", and either directly targeted or purposely excluded from policy responses. In India, migrant workers have been doused in disinfectant by authorities (Al Jazeera, 2020b). Communities of Rohingya migrants have been targeted by police raids in Malaysia (Reuters, 2020). In the Gulf states, low-income migrants from South and South-East Asia have been fired and are excluded from emergency financial protections (Al Jazeera, 2020c; The Guardian, 2020c). More generally, migrants have been severely discriminated against in the Middle East and North Africa region (Amnesty International (2021), 2021). The same situation is occurring with South and South-East Asian migrants in Singapore (The Guardian, 2020d) and central Asian migrants in Russia (ABC News, 2020).<sup>23</sup>

*Doctors.* Health workers have been discriminated against in the U.S. (The Washington Post, 2020c) and attacked, or evicted from their homes, in India, Ivory Coast, Mexico, Pakistan and the Philippines (BBC, 2020; Attacks, 2020; New York Times, 2020b). Likewise, various governments have blamed the World Health Organization for the spread of the disease (New York Time, 2020c).

*Government Officials.* There have also been anti-lockdown protests calling for violent actions against specific government officials (Los Angeles Times, 2020; The Washington Post, 2020d).<sup>24</sup>

*Foreign Nations.* Other countries have been blamed for creating the virus or intentionally not doing enough to control it (Nature, 2020; The Atlantic, 2020; Bartoš, Bauer, Cahliková, & Chytilová, 2020).

Overall, available evidence suggests that the *mild scapegoating scenario* is occurring more often than other scenarios. In contexts where tensions were already rife, we can see a few cases corresponding to the more *violent scapegoating scenario*.<sup>25</sup>

<sup>21</sup> In addition, Muslim businesses have been boycotted, Muslims are sometimes prevented from using public toilets and collecting food provisions from ration shops, and localities have set up blockades to bar Muslims from entering (The Guardian, 2020a).

<sup>22</sup> In Pakistan, Shia pilgrims returning from Iran have been found to be a source of the spread of the virus (Badshah, Ullah, & Badshah, 2020) resulting in blame against the Shia minority.

<sup>23</sup> Because migrants have to work to survive, and travel significant distances to find work, they are more likely to become infected and are at a higher risk of being carriers of infection when they return (Ahsan, Iqbal, Khan, Mobarak, & Abu Shonchoy, 2020; Khanna, Kochhar, & Zaveri, 2020). Using phone surveys in Bangladesh, Ahsan et al. (2020) find that human mobility is critical to the geographic spread of COVID-19 and that communities where a migrant returned in the 2 weeks prior were 242% more likely to report COVID-19 symptoms. The finding raises concerns that returning migrants could face increasing stigma (Kumar & Mohanty, 2020).

<sup>24</sup> Studies suggest that provision of misinformation on mass media has been used as a political weapon to dismiss government calls for measures designed to contain the epidemic (Bursztyjn, Rao, Roth, & Yanagizawa-Drott, 2020).

<sup>25</sup> However, Barrett and Chen (2021) use an index based on press coverage of social unrest to show that social conflict initially decreased with COVID, since it dissuaded social activities. Likewise, there is evidence that lockdown policies implemented as a result of COVID-19 might have reduced armed conflict (Berman & Ticku, 2020).

<sup>18</sup> Source for the CFR estimate: <https://www.worldometers.info/coronavirus/>.

<sup>19</sup> Even if IFRs are higher for the elderly, a high share of the deaths could come from younger adults in developing countries (The Washington Post, 2020a), because population density is high in poorer areas, health systems are fragile, and people must keep working to survive (The Washington Post, 2020a). Likewise, while COVID is seen as an urban disease, it could become more lethal in rural areas, where the population is older, and access to health infrastructure limited (The Washington Post, 2020b).

<sup>20</sup> See [https://en.wikipedia.org/wiki/COVID-19\\_pandemic](https://en.wikipedia.org/wiki/COVID-19_pandemic) for the latest "quantitative" information on COVID-19.



### 5.3. Parallels with other epidemics

We now use our grid of analysis from [Section 4](#) to discuss how the epidemiological and contextual characteristics of COVID-19 might explain some of these scapegoating cases.

As explained in Subsection 4.3, high-mortality epidemics do not necessarily lead to scapegoating because extreme pandemics might raise wages and the economic value of minorities and migrants due to labor scarcity. In addition, high-mortality epidemics increase the need for social bonding. Because COVID-19 is not that deadly overall, it is similar to the 1918 Influenza or the African Ebola outbreaks of the 2010 s. These epidemics led to medicalized prejudice, discrimination, and individual cases of targeted violence, and a few violent and murderous riots in the case of Ebola. But social conflict in the case of COVID-19 has not reached the levels seen during the Cholera riots or the Black Death. Why is that?

First, as discussed in Subsection 4.4, frightening symptoms may increase the likelihood of violent scapegoating. However, COVID-19's symptoms are not as apparent or easily observed as compared to previous epidemics.

Second, in Subsection 4.5 we described how epidemics that disproportionately killed the poor led to conspiracy theories that the elite were using these epidemics to get rid of them. Likewise, populations appear to have reacted more strongly to epidemics disproportionately killing children. In contrast, COVID-19 disproportionately kills older individuals, who tend to be richer. However, it is true that mortality is higher for the poor for a given age category. Nonetheless, many government members and celebrities have been affected too (Boris Johnson, Donald Trump, Amitabh Bachchan, Tom Hanks, Idris Elba, Khloé Kardashian, etc.). Such cases have been widely publicized, weakening conspiracy theories that the virus was created to eradicate the poor.

Third, in Subsection 4.6 we highlighted the fact that scapegoating should be more likely in societies with intermediary (average) levels of epidemic knowledge, as was for example the case during the Medieval era. How do levels of knowledge in today's developed and developing countries compare to what was observed then? In Subsection 4.7, we explained that the "distribution" of epidemic knowledge in a society is important, because it affects its power-weighted mean level of knowledge. We believe that this applies to COVID-19 as well. Countries where populations are less formally educated and have lower access to unbiased information tend to have relatively well-trained and well-informed bureaucracies. International organizations, NGOs, members of the health and scientific communities, the media, community leaders and celebrities are then strongly involved in expanding scientific knowledge across the globe, especially against campaigns of misinformation. Thus, even in countries where large swaths of the population have limited access to knowledge more broadly, authorities have adopted better policies and better informed populations than governments of the pre-modern era. As such, even in the poorest countries today, it is likely that the levels of scientific knowledge are higher than during the pre-modern era.<sup>26</sup>

Fourth, contexts where scapegoating have occurred appear to fit the patterns described in Subsection 4.7 where we discussed the importance of knowledge and cultural differences in a society.

There have been examples of scapegoating when minority segments of the population, for example religious minorities or migrant communities, tend to perform actions that may facilitate epidemic transmission, whether due to lack of knowledge or due to other considerations (e.g., faith or economic survival) outweighing epidemic control considerations. This has created opportunities for elites and/or majority groups to exploit such situations, leading to the scapegoating of these specific communities. Yet, scapegoating may produce counterproductive effects, making community engagement better options in such cases. Knowledge at the "top" about how to involve communities is essential.<sup>27</sup>

Next, there have also been cases where members of a relatively poorer and less knowledgeable majority have used the situation to blame minority groups, even when such groups did not contribute to epidemic transmission. Sometimes, they did so with the informal consent, or even encouragement, of government authorities. In the U.S., Chinese Americans are more educated and have incomes that are 30% higher than for White Americans ([American Community Survey, 2018](#)). Yet, Asian Americans have been disproportionately victims of acts of scapegoating, and members of the U.S. government, including the former President Donald Trump, have used derogatory terms implying that individuals of Asian origin in the U.S. are somewhat guilty for the pandemic. In India, the spread of COVID-19 has been blamed on Muslim communities participating in super-spreader events. Yet, Hindu festivals have been authorized, and promoted, even though the same super-spreader risks prevail.

Finally, in Subsection 4.8, we explained that contexts where rife intergroup tensions already exist and contexts where not-necessarily benevolent governments adopt policies that contribute to distrust are more likely to see occurrences of scapegoating. Interestingly, intergroup tensions are not as rife as they were historically, especially in the past when wars were more frequent and international migration levels were higher due to porous borders. Conversely, where prevailing religious or communal cleavages are high, COVID-19 has ignited riots, as is the case in India for example. Likewise, among richer countries, COVID-19 has led to more cases of blame, conspiracy theories and violent anti-lockdown protests in the US, where interethnic tensions were already high, conspiracy theories already in vogue, and distrust in the government more entrenched before the pandemic. However, and with a few exceptions, governments have not encouraged scapegoating. If anything, governments have implemented more pro-poor agendas during the COVID-19 crisis than the governments of the 19th century and before did. Reinforced social safety nets might have then sufficiently reduced levels of chronic stress, which typically causes displacement aggression.

### 5.4. Policy lessons

First, governments stand to gain from ensuring that the poor, migrants, and minorities are systematically included in their medical and economic responses to COVID-19. Exclusion of such groups would increase the risk of the socially excluded communities acting as COVID-19 hotspots. This risk is amplified by the fact that the poor and migrants often reside in slums and lack access to

<sup>26</sup> One may wonder whether there will be more social conflict associated with pandemics in the future, given the increasingly lower costs of spreading falsehoods. Today, mostly due to the rise of the internet, there are many channels of information. As a result, false information is more widely propagated even when it is scientifically untrue and the statements are falsifiable and have been falsified. There are then political (and economic) rewards for those engaged in falsification. Combined with the lower costs of spreading disinformation today, falsification may continue to trend upward, including in a coordinated manner between individuals seeking the same rewards.

<sup>27</sup> For example, ultra-Orthodox Jews have been blamed for defying COVID rules in Israel (AP News, 2021) and the US ([The Guardian, 2020](#)). Ultra-Orthodox follow a strict interpretation of Judaism. For example, women belonging to the community have to immerse themselves naked in a ritual pool after their period, which may spread COVID. The question is how to find the right balance between religious freedom and equality before the law, and how to best convince leaders of more religious communities to help in the fight against COVID. For example, and focusing on Islam, [Voigtlander and Voth \(2021\)](#) find that community religious leaders have an important role in instructing congregants to comply with public health guidelines when attending religious gatherings ([The Economist, 2020](#)).

health, hygiene, water, and sanitation infrastructure that is critical to containing the spread of diseases. Indeed, when health externalities are large, as is the case when trying to lower COVID's effective reproduction number, government programs are economically justified in subsidizing the livelihoods and health care of the poor and migrants. The spread of COVID-19 related conspiracy theories, often conflated with other political objectives, militates against these policies.

Second, governments stand to gain from transparency in their responses. If governments do not have a clear plan that openly considers the trade-offs between saving lives directly and letting poverty increase, lives will be lost. If populations develop a distrust of governments because of their inability to control the spread of the disease and mitigate its impact on the economy, disease control policies will become increasingly difficult to impose. As distrust in governments grows and states become more fragile, risks that various groups may exploit the situation to scapegoat other groups increase.

Lastly, exclusionary policies where local communities are purposely or unintentionally excluded from decision and action processes can also have counter-productive effects, if it contributes to inefficiency in the disease control policies adopted by authorities, if it causes distrust in the government, or if it spurs conflict between groups. Governments must abstain from encouraging actions that promote stigma (United Nations, 2020). Discrimination is likely to rise if susceptibility to the virus is associated with specific groups – such as the poor, migrants and minorities –, for example due to underlying differences in access to hygiene infrastructure. More directly, governments must ensure that the rule of law is enforced, and that national action plans against discrimination are adopted and applied.

## CRediT authorship contribution statement

**Remi Jedwab:** Conceptualization, Investigation, Writing - original draft, Writing - review & editing. **Amjad M. Khan:** Conceptualization, Investigation, Writing - original draft, Writing - review & editing. **Jason Russ:** Conceptualization, Funding acquisition, Investigation, Writing - review & editing. **Esha D. Zaveri:** Conceptualization, Investigation, Writing - review & editing.

## Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## References

- Aberth, J. (2010). *From the Brink of the Apocalypse: Confronting Famine, War, Plague, and Death in the Later Middle Ages*. London: Routledge.
- Ahsan, R., Iqbal, K., Khan, M., Mobarak, A. M., & Abu Shonchoy, A. (2020). *Using Migration Patterns to Predict COVID-19 Risk Exposure in Developing Countries*. Yale Research Initiative on Innovation and Scale: Policy Brief.
- Alfani, G. (2020). Economic Inequality in Preindustrial Times: Europe and beyond. *Journal of Economic Literature*.
- Alfani, G., & Bonetti, M. (2019). A survival analysis of the last great European plagues: The case of Nonantola (Northern Italy) in 1630. *Population Studies*, 73 (1), 101–118.
- Algan, Yann & Cahuc, Pierre, 2014. "Trust, Growth, and Well-Being: New Evidence and Policy Implications," in: Philippe Aghion & Steven Durlauf (ed.), *Handbook of Economic Growth*, edition 1, volume 2, chapter 2, p. 49–120.
- The global burden of cholera M. Ali A.L. Lopez Y.A. You Y.E. Kim B. Sah B. Maskery J. Clemens Bulletin of the World Health Organization 90 2012
- Allport, G. W. (1979). *The Nature of Prejudice*. Cambridge, MA: Perseus Books.
- Almond, D. (2006). Is the 1918 influenza pandemic over? Long-term effects of in utero influenza exposure in the post-1940 US population. *Journal of political Economy*, 114(4), 672–712.
- Ambrus, Attila, Erica Field, and Robert Gonzalez, 2020. "Loss in the Time of Cholera: Long-Run Impact of a Disease Epidemic on the Urban Landscape," *American Economic Review*, February 2020, 110 (2), 475–525.
- American Community Survey (2018). "S0201: Selected Population Profile in the United States". American Community Survey 2018. United States Census Bureau. Retrieved July 26, 2020.
- Amnesty International (2021). MENA: COVID-19 amplified inequalities and was used to further ramp up repression. 7 April 2021. London: Amnesty International
- Andersson, H., & Treich, N. (2011). *The Value of a Statistical Life*. Mimeo.
- Ashraf, Nava, Edward L. Glaeser, and Giacomo A. M. Ponzetto. 2016. "Infrastructure, Incentives, and Institutions," *American Economic Review*, May 2016, 106 (5), 77–82.
- Badgett, L. (2014). *The economic cost of stigma and the exclusion of LGBT people: A case study of India*. Washington: World Bank.
- S.L. Badshah A. Ullah S.H. Badshah I. Ahmad Spread of Novel coronavirus by returning pilgrims from Iran to Pakistan *Journal of Travel Medicine* 27, no. 3 2020 taaa044
- Baker, S. R., Bloom, N., Davis, S. J., & Terry, S. J. (2020). *Covid-induced economic uncertainty* (No. w26983). National Bureau of Economic Research.
- Balmford, B., Bateman, I. J., Bolt, K., Day, B., & Ferrini, S. (2019). The value of statistical life for adults and children: Comparisons of the contingent valuation and chained approaches. *Resource and Energy Economics*, 57, 68–84.
- Barquet, N., & Domingo, P. (1997). Smallpox: The triumph over the most terrible of the ministers of death. *Annals of internal medicine*, 127(8 Pt 1), 635–642.
- Barrett, Philip & Sophia Chen, 2021. "Social Repercussions of Pandemics," IMF Working Papers 2021/021, International Monetary Fund.
- Barro, R. J. (2020). *Non-Pharmaceutical Interventions and Mortality in US Cities during the Great Influenza Pandemic, 1918–1919*. National Bureau of Economic Research: Technical Report.
- Barro, Robert J., Jose F. Ursua, and Joanna Weng. 2020. "The Coronavirus and the Great Influenza Pandemic: Lessons from the "Spanish Flu" for the Coronavirus's Potential Effects on Mortality and Economic Activity," NBER Working Papers 26866, National Bureau of Economic Research, Inc March 2020.
- Bartoš, V., Bauer, M., Cahliková, J., & Chytilová, J. (2020). "Covid-19 Crisis Fuels Hostility against Foreigners". *CESifo Working Paper*, No. 8309.
- Bazzi, Samuel & Christopher Blattman. 2014. "Economic Shocks and Conflict: Evidence from Commodity Prices," *American Economic Journal: Macroeconomics* vol. 6(4), pages 1–38, October.
- BBC (2020). *Coronavirus: Ivory Coast protesters target testing centre*. London, UK: BBC.
- BBC. (2021). Covid 'hate crimes' against Asian Americans on rise. 2 April 2021. London: BBC.
- Beach, Brian, Karen Clay, and Martin Saavedra. 2020. "The 1918 Influenza Pandemic: The Health and Economics Effects," *Journal of Econ. Lit.*
- Benedictow, O. J. (2005). *The Black Death 1346–1353: The Complete History*. Woodbridge: The Boydell Press.
- Benedictow, O. J. (2010). *What Disease was Plague? On the Controversy over the Microbiological Identity of Plague Epidemics of the Past*. Leiden: Brill.
- Berman, Nicolas & Mathieu Couttenier & Nathalie Monnet & Rohit Ticku, 2020. "Shutdown Policies and Worldwide Conflict," Working Papers 20-16, Chapman University, Economic Science Institute.
- Blake, Lauren E. and Mariano A. Garcia-Blanco. 2014. "Human Genetic Variation and Yellow Fever Mortality during 19th Century U.S. Epidemics," *mBio*, 2014, 5 (3).
- Blattman, Christopher and Edward Miguel. 2010. "Civil War," *Journal of Economic Literature*, American Economic Association, vol. 48(1), pages 3–57, March.
- Bloom, David E. and David Canning. 2006. "Epidemics and Economics," PGDA Working Papers 0906, Program on the Global Demography of Aging June 2006.
- Bloom, D. and Ajay Mahal. 1997. "AIDS, flu, and the Black Death: impacts on economic growth and well-being," Oxford University Press: in D. Bloom and P. Godwin (eds): *The Economics of HIV and AIDS: The Case of South and South-East Asia*, 1997.
- Bó, D., & Ernesto & Pedro Dal Bó. (2011). *Workers, Warriors, And Criminals: Social Conflict In General Equilibrium*. *Journal of the European Economic Association*, 9 (4), 646–677.
- Bolt, Jutta and Jan Luiten van Zanden. 2014. "The Maddison Project: collaborative research on historical national accounts," *Economic History Review*, 2014, 67 (3), 627–651.
- Bornstein, D. E. (1993). *The Bianchi of 1399: Popular Devotion in Late Medieval Italy*. Cornell University Press.
- Bosin, Y. V. (2009). *Russia, Cholera Riots of 1830–1831*. American Cancer Society.
- Boucekkine, Raouf, Rodolphe Desbordes, and Helene Latzer. 2009. "How do epidemics induce behavioral changes?" *Journal of Economic Growth*, September 2009, 14 (3), 233–264.
- Bowles, Jeremy, Jonas Hjort, Timothy Melvin, and Eric Werker. 2016. "Ebola, jobs and economic activity in Liberia," *J Epidemiol Community Health*, 2016, 70 (3), 271–277.
- Bursztyn L., Akash Rao, Christopher Roth, and David Yanagizawa-Drott. 2020. "Misinformation During a Pandemic." Becker Friedman Institute for Economics Working Paper Series 2020-44, Becker Friedman Institute, Chicago, Il. 2, 1, 15
- Byrne, J. (2012). *Encyclopedia of the Black Death*. ABC-CLIO.
- Card, D., Dustmann, C., & Preston, I. (2012). Immigration, wages, and compositional amenities. *Journal of the European Economic Association*, 10(1), 78–119.
- Carrigan, J. A. (1961). *The Saffron Scourge: A History of Yellow Fever in Louisiana*. *LSU Historical Dissertations and Theses*, 666, 1796–1905.
- CDC CDC Fact Sheet: Today's HIV/AIDS Epidemic Centers for Disease Control and Prevention 2016
- CDC COVID-19 Pandemic Planning Scenarios Centers for Disease Control and Prevention 2020

- Chazan, R. (2010). *Reassessing Jewish Life in Medieval Europe*. Cambridge: Cambridge University Press.
- Chin, Y.-M. (2013). Does HIV increase the risk of spousal violence in sub-Saharan Africa? *Journal of Health Economics*, 32(5), 997–1006.
- Christakos, G., Olea, R. A., Serre, M. L., Hwa-Lung, Y. u., & Wang, L.-L. (2005). *Interdisciplinary Public Health Reasoning and Epidemic Modelling: The Case of Black Death*. Berlin: Springer.
- Clay, Karen, Joshua Lewis, and Edson Severnini. 2018. "Pollution, Infectious Disease, and Mortality: Evidence from the 1918 Spanish Influenza Pandemic," *Journal of Economic History*, 2018, 78 (4), 1179–1209.
- Clemens, J. D., Balakrish Nair, G., Ahmed, T., Qadri, F., & Holmgren, J. J. (2017). Cholera. *The Lancet*, 390(10101), 1539–1549.
- Cohn, S. K. (2007). After the Black Death: Labour legislation and attitudes towards labour in late-medieval Western Europe. *The Economic History Review*, 60(3), 457–485.
- Cohn, S. K. (2012). Pandemics: Waves of disease, waves of hate from the Plague of Athens to A.I.D.S. *Historical Journal*, 85(230), 535–555.
- Cohn, S. K. (2017). Cholera revolts: A class struggle we may not like. *Social History*, 42(2), 162–180.
- Cohn, S. K. (2018). *Epidemics: Hate and Compassion from the Plague of Athens to AIDS*. Oxford: Oxford University Press.
- Cohn, S. K., & Kutalek, R. (2016). *Historical Parallels* (p. 8). Ebola Virus Disease and Cholera: Understanding Community Distrust and Social Violence with Epidemics. *PLoS currents*.
- Collier, P., & Hoeffler, A. (2004). Greed and grievance in civil war. *Oxford Economic Papers*, 56(4), 563–595.
- R. Collier The Plague of the Spanish Lady: The Influenza Pandemic of 1918–1919 New Edition 1996 Allison & Busby
- Converse, Benjamin A., Jane L. Risen, and Travis J. Carter. 2012. "Investing in Karma: When Wanting Promotes Helping," *Psychological Science*, 2012, 23 (8), 923–930.
- Craddock, S. (2004). *City of Plagues: Disease, Poverty, and Deviance in San Francisco*. Minneapolis, MI: University of Minnesota Press.
- Crosby, Alfred W. 2003. America's forgotten pandemic: the influenza of 1918. Cambridge University Press, 2003.
- Cutler, D., & Miller, G. (2005). The role of public health improvements in health advances: The twentieth-century United States. *Demography*, 42(1), 1–22.
- Davies, J. (2016). *Aspects of Violence in Renaissance Europe*. Routledge.
- de la Fuente, A., Jacoby, H. G., & Lawin, K. G. (2020). Impact of the West African Ebola Epidemic on Agricultural Production and Rural Welfare: Evidence from Liberia. *Journal of African Economies*, 06 2020. eja002.
- Djemai, E. (2018). Roads and the spread of HIV in Africa. *Journal of Health Economics*, 2018(60), 118–141.
- Doob, L. W., Miller Neal, E., Hobart, M. O., & John, S. R. D. (1939). *Frustration and Aggression*. New Haven, CT: Yale University Press.
- Duncan-Jones, R. P. (1996). The impact of the Antonine plague. *Journal of Roman Archaeology*, 9, 108–136.
- Dustmann, C., Vasiljeva, K., & Piil Damm, A. (2019). Refugee Migration and Electoral Outcomes. *Review of Economic Studies*, 86(5), 2035–2091.
- Eamon, W. (1998). Cannibalism and contagion: Framing syphilis in counter-reformation Italy. *Early Science and Medicine*, 3(1), 1–31.
- The Economist (2020). The Economist Restrictions and rebellion follow New York City's covid-19 surge. Oct 17th 2020 edition 2020 The Economist London.
- Esteban, J., Mayoral, L., & Ray, D. (2012). Ethnicity and Conflict: An Empirical Study. *American Economic Review*, 102, 1310–1342.
- Esteban, J., & Ray, D. (2008). On the Salience of Ethnic Conflict. *American Economic Review*, 98(5), 2185–2202.
- Esteban, Joan & Debraj Ray, 2011a. "Linking Conflict to Inequality and Polarization," *American Economic Review* vol. 101(4), pages 1345-1374, June.
- Evans, R. J. (1988). Epidemics and Revolutions: Cholera in Nineteenth-Century Europe. *Past & Present*, 120, 123–146.
- Facchini, G., & Mayda, A. M. (2009). Does the Welfare State Affect Individual Attitudes toward Immigrants? Evidence across Countries. *The Review of Economics and Statistics*, 91(2), 295–314.
- Farmacija, H. S. (1997). i veliki doprinosi Arapske islamske znanosti u njenom razvitku [Pharmacy and the great contribution of Arab-Islamic science to its development]. *Medicinski arhiv*, 51(1–2), 47–50.
- Fortson, J. G. (2011). Mortality risk and human capital investment: The Impact of HIV/AIDS in Sub-Saharan Africa. *The Review of Economics and Statistics*, 93(1), 1–15.
- Galer, O. (2011). *Unified Growth Theory* (p. 2011). Princeton, New Jersey: Princeton University Press.
- Gensini, G. F., Yacoub, M. H., & Conti, A. A. (2004). The concept of quarantine in history: From plague to SARS. *Journal of Infection*, 49(4), 257–261.
- Gilman, Sander L. 1987. "AIDS and Syphilis: The Iconography of Disease," October, 1987, 43, 87–107.
- Girard, R. (1978). *Things Hidden Since the Foundation of the World* (p. 1978). Stanford, CA: Stanford University Press.
- Glaeser, E. L., & Gyourko, J. (2005). Urban decline and durable housing. *Journal of Political Economy*, 113(2), 345–375.
- Glick, P. (2002). 2002. "Sacrificial Lambs Dressed in Wolves' Clothing". In Leonard S. Newman & Ralf Erber (Eds.), *Understanding Genocide*. Oxford: Oxford University Press.
- Glick, P. (2005). Choice of Scapegoats. In John F. Dovidio, Peter Glick, & Laurie A. Rudman (Eds.), *On the Nature of Prejudice: 50 Years after Allport* (pp. 244–261). MA: Blackwell Malden.
- Glick, P. (2009). *When Neighbors Blame Neighbors: Scapegoating and the Breakdown of Ethnic Relations*. Blackwell Publishing Ltd..
- Hackman DA, Farah MJ, and Meaney MJ. 2010. Socioeconomic status and the brain: mechanistic insights from human and animal research. *Nat Rev Neurosci*. Sep; 11(9):651-9.
- Hainmueller, Jens and Daniel J. Hopkins. 2014. "Public Attitudes Toward Immigration," Annual Review of Political Science, 2014, 17 (1), 225–249.
- Harper, Kyle. 2017. The fate of Rome: Climate, disease, and the end of an empire. Princeton University Press, 2017.
- Hayden, S. (2019). *How Misinformation Is Making It Almost Impossible to Contain the Ebola Outbreak in DRC*. New York City: Time.
- Hohenberg, Paul M. 2004. "The historical geography of European cities: an interpretive essay," in Vernon Henderson and J.F. Thisse, eds., *Handbook of Regional and Urban Economics*, Vol. 4 Elsevier 2004, pp. 3021–3052.
- Horrox, R. (1994). *The Black Death*. Manchester: Manchester University Press.
- Hovland, C. I., & Sears, R. R. (1940). Minor Studies of Aggression: VI. Correlation of Lynchings with Economic Indices. *The Journal of Psychology*, 9(2), 301–310.
- Huber, Caroline, Lyn Finelli, and Warren Stevens. 2018. "The economic and social burden of the 2014 Ebola outbreak in West Africa," *The Journal of infectious diseases*, 2018, 218 (suppl 5), S698–S704.
- Human Rights Watch (2020). *Covid-19 Fueling Anti-Asian Racism and Xenophobia Worldwide* (p. 2020). New York City: Human Rights Watch.
- Humphreys, M. (1999). *Yellow fever and the South*. Baltimore, MD: Johns Hopkins University Press.
- Iliffe, J. (2005). *The African AIDS Epidemic: A History*. Ohio University Press.
- Jaret, C. (1999). "Troubled by Newcomers: Anti-Immigrant Attitudes and Action during Two Eras of Mass Immigration to the United States. *Journal of American Ethnic History*, 18(3), 9–39.
- Jazeera, A. I. (2020a). *Muslims face extra threat as coronavirus stirs hate*. Doha: Al Jazeera.
- Jazeera, A. I. (2020b). *Migrants in India sprayed with disinfectant to fight coronavirus*. Doha: Al Jazeera.
- Jazeera, A. I. (2020c). *In the Gulf, migrant workers bear the brunt of the pandemic*. Doha: Al Jazeera.
- Jedwab, Remi, Noel Johnson, and Mark Koyama. 2020a. "Pandemics and Cities: Evidence from the Black Death and the Long-Run." Mimeo.
- Jedwab, R., Johnson, N. D., & Koyama, M. (2019). Negative shocks and mass persecutions: Evidence from the Black Death. *Journal of Economic Growth*, 24(4), 345–395.
- Jedwab, R., Johnson, N., & Koyama, M. (2020). The Economic Impact of the Black Death. *Journal of Econ. Lit.*.
- Jedwab, R., & Vollrath, D. (2019). The urban mortality transition and poor-country urbanization. *American Economic Journal: Macroeconomics*, 11(1), 223–275.
- Jester, B., Uyeki, T. M., Jernigan, D. B., & Tumpey, T. M. (2019). Historical and clinical aspects of the 1918 H1N1 pandemic in the United States. *Virology*, 527, 32–37.
- Joan, E., & Ray, D. (1994). On the measurement of polarization. *Econometrica*, 62, 819–852.
- Johnson, N., & Koyama, M. (2019). *Persecution and Toleration: The Long Road to Religious Freedom*. Cambridge: Cambridge University Press.
- Jones, M. M. (2010). The American red cross and local response to the 1918 Influenza Pandemic: A Four City Case Study. *Public Health Reports*, 125(3 suppl), 92–104. PMID: 20568571.
- Kent, M. E., & Romanelli, F. (2008). Reexamining syphilis: An update on epidemiology, clinical manifestations, and management. *Annals of Pharmacotherapy*, 42(2), 226–236.
- Khanna, Madhulika, Nishtha Kochhar, and Esha Zaveri. 2020. "Ensuring safety of migrants key policy challenge for govt", *Hindustan Times*, May 9.
- Kidambi, Prashant. 2004. 'An infection of locality': plague, pythogenesis and the poor in Bombay, c. 1896–1905. *Urban History*, 31(2), 249–267.
- Kraut, A. M. (2010). Immigration, Ethnicity, and the Pandemic. *Public Health Reports*, 125(3 suppl), 123–133. PMID: 20568574.
- Kumar, Chandan and Debabrata Mohanty. 2020. "Migrant workers battle stigma, bias back home" *Hindustan Times*, May 11.
- Last, J. M. (2007). "Miasma theory". *A Dictionary of Public Health*. Westminster College: Oxford University Press.
- Leung, J., & Guria, J. (2006). Value of statistical life: Adults versus children. *Accident; analysis and prevention*, 38(6), 1208–1217.
- Lin, L., Hall, B. J., Khoe, L. C., Bodomo, A. B., & Rothstein, M. A. (2015). Ebola outbreak: From the perspective of African migrants in China. *American journal of public health*, 105(5), E5.
- Little, Lester K. 2008. *Plague and the End of Antiquity: The Pandemic of 541-750*. Cambridge University Press, 2008.
- Littman, R. J. (2009). The Plague of Athens: Epidemiology and Paleopathology. *Mt Sinai J Med*, 76, 456–467.
- Los Angeles Times (2020). *Role of extremist groups at California lockdown protests raises alarms*. Los Angeles, CA: Los Angeles Times.
- Mahal, A. (2004). Economic Implications of Inertia on HIV/AIDS and Benefits of Action. *Economic and Political Weekly*, 39(10), 1049–1063.
- Mamelund, S.-E. (2006). A socially neutral disease? Individual social class, household wealth and mortality from Spanish influenza in two socially contrasting parishes in Kristiania 1918–19. *Social science & medicine*, 62(4), 923–940.
- Mamelund, S.-E. (2018). 1918 pandemic morbidity: The first wave hits the poor, the second wave hits the rich. *Influenza and Other Respiratory Viruses*, 12(3), 307–313.



- Manguvo, A., & Mafuvadze, B. (2015). The impact of traditional and religious practices on the spread of Ebola in West Africa: Time for a strategic shift. *The Pan African Medical Journal*, 22(Suppl), 1.
- Mansuri, G., & Rao, V. (2004). Community-based and-driven development: A critical review. *The World Bank Research Observer*, 19(1), 1–39.
- Markel, Howard, Harvey B Lipman, J Alexander Navarro, Alexandra Sloan, Joseph R Michalsen, Alexandra Minna Stern, and Martin S Cetron. 2007. "Nonpharmaceutical interventions implemented by US cities during the 1918-1919 influenza pandemic," *Jama*, 2007, 298 (6), 644–654.
- Martin, L. J., Hathaway, G., Isbester, K., Mirali, S., Acland, E. L., Niederstrasser, N., ... Mogil, J. S. (2015). Reducing social stress elicits emotional contagion of pain in mouse and human strangers. *Curr Biol. Feb 2*, 25(3), 326–332.
- Mayda, A. M. (2006). Who Is Against Immigration? A Cross-Country Investigation of Individual Attitudes toward Immigrants. *The Review of Economics and Statistics*, 88(3), 510–530.
- Donna McKay Michele Heisler Ranit Mishori Howard Catton Otmar Kloiber Attacks against health-care personnel must stop, especially as the world fights COVID-19 vol. 395,10239: 2020 *Lancet* (London, England) 10.1016/S0140-6736(20)31191-0 1743 1745
- Miguel, Edward & Shanker Satyanath & Ernest Sergenti. 2004. "Economic Shocks and Civil Conflict: An Instrumental Variables Approach." *Journal of Political Economy*, vol. 112(4), pages 725–753, August.
- Miller, J. C. (2005). The Wages of Blackness: African American Workers and the Meanings of Race during Philadelphia's 1793 Yellow Fever Epidemic. *The Pennsylvania Magazine of History and Biography*, 129(2), 163–194.
- Mills, I. (1986). The 1918–1919 influenza pandemic - the Indian experience. *The Indian Economic & Social History Review*, 23(1), 1–40.
- Mokyr, J., & Stein, R. (1996). "Science, health, and household technology: The effect of the Pasteur revolution on consumer demand", in *The economics of new goods*. University of Chicago Press, 143–206.
- Moore, R. I. (1987). *The Formation of a Persecuting Society: Power and deviance in Western Europe, 950–1250*. Oxford: Basil Blackwell.
- Munro, J. (2003). The Medieval Origins of the Modern Financial Revolution. *The International History Review*, 25, 505–562.
- Nature. (2020). *The epic battle against coronavirus misinformation and conspiracy theories*. London, UK: Nature.
- Nelkin, Dorothy and Sander L. Gilman. 1988. "Placing Blame for Devastating Disease," *Social Research*, 1988, 55 (3), 361–378.
- New York Times (2020a). *Spit On, Yelled At, Attacked: Chinese-Americans Fear for Their Safety*. New York: New York Times.
- New York Times (2020b). *'Afraid to Be a Nurse': Health Workers Under Attack*. New York: New York Times.
- News, A. B. C. (2020). *Coronavirus lockdown leaves hundreds of thousands of migrants without food in Russia*. New York: ABC News.
- Nicholas, D. (1999). *The Transformation of Europe 1300–1600*. London: Arnold Publishers.
- Oldstone, M. (2012). *Viruses, Plagues, and History: Past (p. 2012). Present and Future*: Oxford University Press.
- Oliverius, Kathryn. 2016. *Necropolis: Yellow Fever, Immunity, and Capitalism in the Deep South, 1800–1860*. New Haven, CT: PhD Dissertation, University of Oxford.
- Oster, Emily. 2012. "Routes of Infection: Exports and HIV Incidence in Sub-Saharan Africa" *Journal of the European Economic Association*, 2012, 10 (5), 1025–1058.
- Patterson, D. (1992). Yellow fever epidemics and mortality in the United States 1693–1905. *Social Science & Medicine*, 34(8), 855–865.
- Poos, L. R. (1991). *A Rural Society After the Black Death*. Cambridge: Cambridge University Press.
- Poppe, Edwin, 2001. "Effects of Changes in GNP and Perceived Group Characteristics on National and Ethnic Stereotypes in Central and Eastern Europe1," *Journal of Applied Social Psychology*, 2001, 31 (8), 1689–1708.
- Ray, Debraj and Joan Esteban. 2017. Conflict and Development. *Annual Review of Economics* 2017 9:1, 263–293.
- Reuters (2020). *Rohingya targeted in Malaysia as coronavirus stokes xenophobia*. London: Reuters.
- Robbins, Helen. 1928. "A Comparison of the Effects of the Black Death on the Economic Organization of France and England," *Journal of Political Economy*, 1928, 36 (4), 447–479.
- Rosenberg, Charles E. 1987. *The cholera years: the United States in 1832, 1849 and 1866*. University of Chicago Press, 1987.
- Routt, D. (2018). *The Economic Impact of the Black Death*. EH: Net Encyclopedia, edited by Robert Whaples.
- Routt, David. 2013. "The Late Medieval Countryside: England's Rural Economy and Society, 1275–1500," *History Compass*, 2013, 11 (6), 474–485.
- Rowan, S. (1984). The Grand Peur of 1348–49: The Shock Wave of the Black Death in the German Southwest. *Journal of the Rocky Mountain Medieval and Renaissance Association*, 5, 19–30.
- Sapolsky, R. M. (2017). *Behave: The Biology of Humans at Our Best and Worst*. London: Penguin Press.
- Sapolsky, R. M. (2018). Doubled-Edged Swords in the Biology of Conflict. *Frontiers in psychology*, 9, 2625.
- Walter Scheidel The great leveler: Violence and the history of inequality from the stone age to the twenty-first century Vol. 74 2018 Princeton University Press
- Boris V. Schmid W. Ulf Buntgen Ryan Easterday Christian Ginzler Lars Walløe Barbara Bramanti ... Stenseth. Proceedings of the National Academy of Sciences 2015 3020 3025
- Sheridan, M. A., Sarsour, K., Jutte, D., D'Esposito, M., & Boyce, W. T. (2012). The impact of social disparity on prefrontal function in childhood. *PLoS One*, 7(4) e35744.
- Snyder, R. E., Marlow, M. A., & Riley, L. W. (2014). *Ebola in urban slums: The elephant in the room* (p. 2014). The Lancet Global Health: Correspondence.
- South Africa (2011). *The National Antenatal Sentinel HIV and Syphilis Prevalence Survey*. Pretoria: National Department of Health.
- Spinney, L. (2017). *Pale rider: The Spanish flu of 1918 and how it changed the world*. PublicAffairs.
- Starcke, Katrin, Christin Polzer, Oliver T. Wolf, and Matthias Brand. 2011. "Does stress alter everyday moral decision-making?" *Psychoneuroendocrinology*, Feb; 36(2):210–9.
- Staub, E. (1992). *The Roots of Evil: The Origins of Genocide and Other Group Violence*. Cambridge: Cambridge University Press.
- Stephenson, K. (2004). *The Quarantine War: The Burning of the New York Marine Hospital in 1858*. Public Health Reports.
- Tabellini, Marco. 2019. "Gifts of the Immigrants, Woes of the Natives: Lessons from the Age of Mass Migration," *The Review of Economic Studies*, 05, 87 (1), 454–486.
- S.A. Tannenbaum Some Current Misconceptions of Psychoanalysis. *The Journal of Abnormal Psychology* vol 12 1918 Old Corner Bookstore
- Taubenberger, J., & Morens, D. (2006). 1918 Influenza: The Mother of All Pandemics. *Emerg Infect Dis*, 12(1), 15–22.
- Taylor, S. E., Klein, L. C., Lewis, B. P., Gruenewald, T. L., Gurung, R. A. R., & Updegraff, J. A. (2000). Biobehavioral responses to stress in females: Tend-and-befriend, not fight-or-flight. *Psychological Review*, 107(3), 411–429.
- The Atlantic (2020). *The Coronavirus Conspiracy Boom*. Washington DC: The Atlantic.
- The Guardian (2020a). *How lives were destroyed under cover of lockdown in a small Indian town*. London: The Guardian.
- The Guardian (2020b). *China fails to stop racism against Africans over Covid-19*. London: The Guardian.
- The Guardian (2020c). *Qatar's migrant workers beg for food as Covid-19 infections rise*. London: The Guardian.
- The Guardian (2020d). *Singapore's cramped migrant worker dorms hide Covid-19 surge risk*. London: The Guardian.
- The New Yorker (2014). *Ebola and the Culture Makers*. New York, NY: The New Yorker.
- The Washington Post (2015). *The fear of Ebola led to slayings — and a whole village was punished*. DC: The Washington Post.
- The Washington Post (2020a). *In the developing world, the coronavirus is killing far more young people*. DC: Washington Post.
- The Washington Post (2020b). *A deadly 'checkerboard': Covid-19's new surge across rural America*. DC: Washington Post.
- The Washington Post (2020c). *Asian American doctors and nurses are fighting racism and the coronavirus*. DC: Washington Post.
- The Washington Post (2020d). *Tensions over restrictions spark violence and defiance among protesters as Trump pushes states to reopen*. Washington DC: The Washington Post.
- The Washington Post. 2019. With more than 1,100 dead, Congo's Ebola outbreak is only getting worse. Now doctors are forced to go undercover. Washington DC: The Washington Post.
- New York Times, 2020c, U.S.-China Feud Over Coronavirus Erupts at World Health Assembly, New York: New York Times.
- Tomori, O. (2004). Yellow fever: The recurring plague. *Crit Rev Clin Lab Sci*, 41(4), 391–427.
- United Nations (2020). *COVID-19: UN counters pandemic-related hate and xenophobia*. New York, NY: United Nations.
- Velde, F. R. (2020). What happened to the U.S. economy during the 1918 influenza pandemic? a view through high-frequency data. *Mimeo*.
- Voigtlander, N., & Voth, H.-J. (2012). Persecution Perpetuated: The Medieval Origins of Anti-Semitic violence in Nazi Germany. *Quarterly Journal of Economics*, 127 (3), 1–54.
- von Dawans, B., Fischbacher, U., Kirschbaum, C., Fehr, E., & Heinrichs, M. (2012). The social dimension of stress reactivity: Acute stress increases prosocial Behavior in Humans. *Psychological Science*, 23(6), 651–660.
- Vyborny, K. (2021). *Persuasion and public health: Evidence from an experiment with religious leaders during COVID-19 in Pakistan*. Mimeo: Duke University.
- Wasserman, Henry. 2007. "Regensburg," in Michael Berenbaum and Fred Skolnik, eds., *Encyclopedia Judaica*, Vol. 17 Macmillan Reference New York, pp. 188–189.
- Weil, D. (2010). Endemic Diseases and African Economic Growth: Challenges and Policy Responses. *Journal of African Economies*, 19(3), 81–109.
- Wexler, P. (2017). *Toxicology in the Middle Ages and Renaissance*. Elsevier Science.
- WHO (2020a). *Smallpox*. Geneva: World Health Organization.
- WHO (2020b). *Plague: Key Facts*. Geneva: World Health Organization.
- WHO (2020c). *Ebola Virus Disease: Key Facts*. Geneva: World Health Organization.
- WHO Ebola Response Team. 2015. "Ebola Virus Disease among Children in West Africa," *New England Journal of Medicine*, 2015, 372 (13), 1274–1277.
- Wolfe, R. M., & Sharp, L. K. (2002). Anti-vaccinationists past and present. *BMJ*, 325 (7361), 430–432.
- Woolcock, M., & Narayan, D. (2000). Social Capital: Implications for Development Theory, Research, and Policy. *The World Bank Research Observer*, 15(2), 225–249.
- World Bank (2020). *Global Economic Prospects: Pandemic, Recession: The Global Economy in Crisis*. DC: World Bank.



- Young, A. (2005). The Gift of the Dying: The Tragedy of Aids and the Welfare of Future African Generations. *The Quarterly Journal of Economics*, 120(2), 423–466.
- Youssef, F. F., Dookeeram, K., Basdeo, V., Francis, E., Doman, M., Mamed, D., ... Legall, G. (2012 Apr). Stress alters personal moral decision making. *Psychoneuroendocrinology*, 37(4), 491–498.
- Zelizer, V. A. (1994). *Pricing the Priceless Child: The Changing Social Value of Children*. Princeton University Press.
- Zinszer, K., Morrison, K., Verma, A., & Brownstein, J. S. (2017). Spatial Determinants of Ebola Virus Disease Risk for the West African Epidemic. *PLOS Currents Outbreaks*, 2017, 1.